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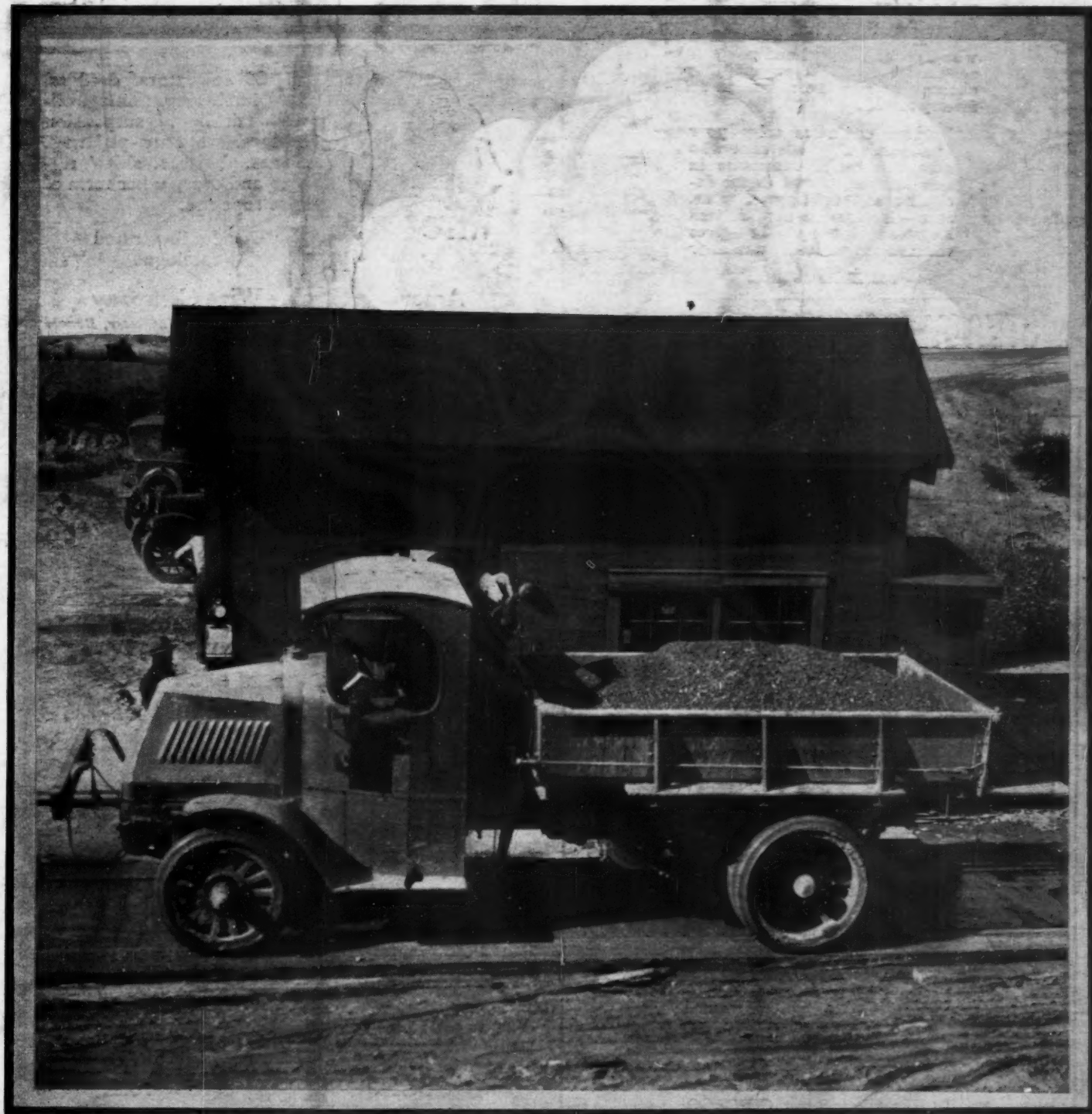
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U.S. DEPARTMENT OF AGRICULTURE

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CHICAGO

DECEMBER 4, 1918



Government Buying Gravel for Roads at Cincinnati Air Nitrates Plant

Dependable KILNS

Perfect calcination with a resultant uniform product demands the use of

Keystone Kilns

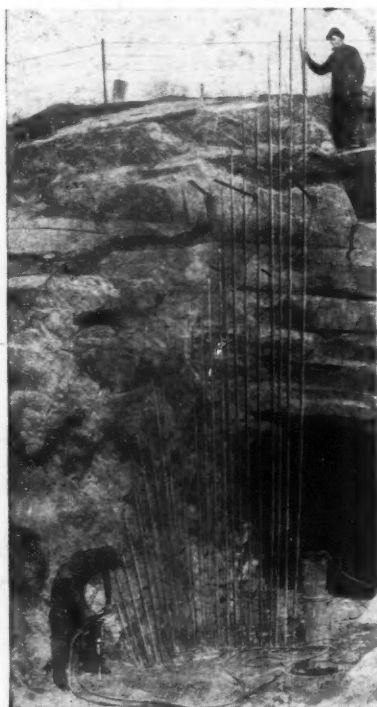
not only for efficient service but also for their economical cost of operation. They are designed for use with coal, wood, oil or gas fuel and you can be certain that whichever model you choose will give the utmost in satisfactory results.

Let our engineers solve your problems. They are men who have had actual experience in lime burning as well as the designing and building of kilns. Also—ask for the new, revised Keystone catalog. It gives valuable suggestions. Write today.

233 Kilns to Date

STEAGY-SCHMIDT MFG. CO.
YORK, PA.

ROTATOR DRILLS



36 Ft.
HOLES

In California, a contractor has been drilling holes 30 ft. deep with

SULLIVAN ROTATORS

Ten of these holes were bottomed at 36 ft.

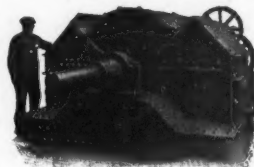
Two other makes of hammer drills quit at 18 ft.

The Power and Mudding ability of Rotators is shown startlingly by this record.

Ask for
Bulletin 3670-F

SULLIVAN MACHINERY CO.
88 East Adams Street, CHICAGO

"PENNSYLVANIA" Hammer Crushers



PATENTED

For Crushing and Pulverizing Lime, Limestone, Gypsum, Marl, Shale, Etc. Main Frame of Steel, "Ball and Socket" Self Aligning Bearings; forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand wheel while Crusher is running. No other hammer Crusher has such a big Safety Factor.

PENNSYLVANIA CRUSHER COMPANY
New York PHILADELPHIA Pittsburgh



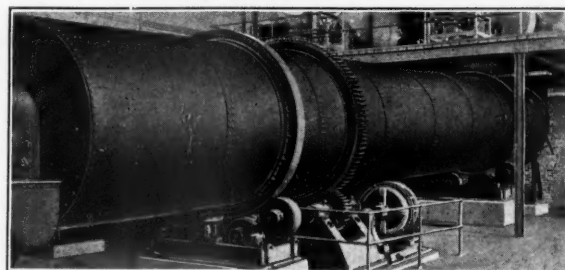
FOR elevators, dredges, lumbering, mining, oil-well drilling, suspension bridges, stump-pulling, cranes, derricks, ships' rigging and every other form of wire rope use.

Ask for illustrated catalogue

American Steel & Wire Company
Chicago, New York, Cleveland, Pittsburgh, Worcester, Denver
Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

RUGGLES-COLES DRYERS

for coal, clays, sand, stone, etc. They will burn less fuel than any other type and with their low power and repair costs are most economical to operate.



BUILT TO DRY AT THE LOWEST ULTIMATE COST

RUGGLES-COLES ENGINEERING CO.
McCORMICK BLDG. 50 CHURCH ST.
CHICAGO WORKS, NEW YORK
YORK, PA.

Rock Products

TRADEPRESS PUBLISHING CORPORATION
538 SOUTH CLARK STREET
CHICAGO

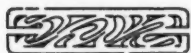
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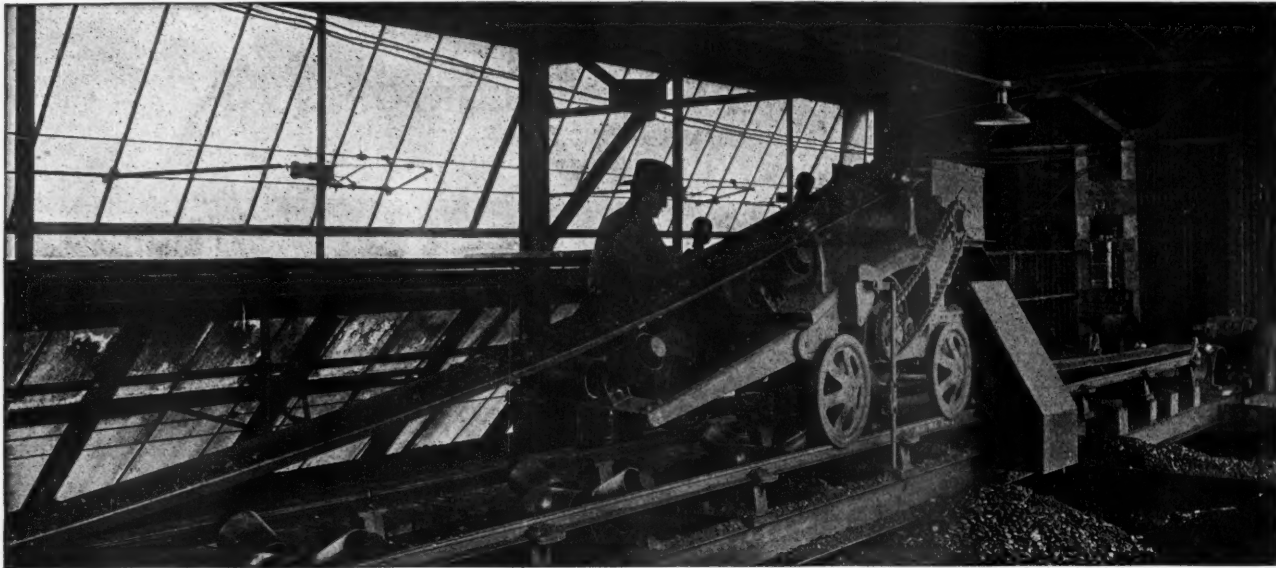
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Handle it Mechanically



Jeffrey Standard Belt Conveyor and Tripper in action, automatically distributing over a given space or discharging materials at any fixed point at the will of the operator.

Practically Any Belt Conveying Requirements

can be quickly met
from Tabulated List of

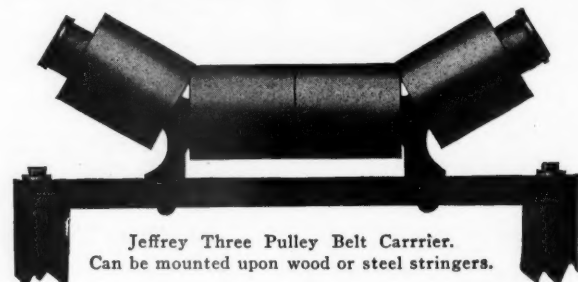
JEFFREY STANDARD BELT CONVEYERS

in our New Catalog

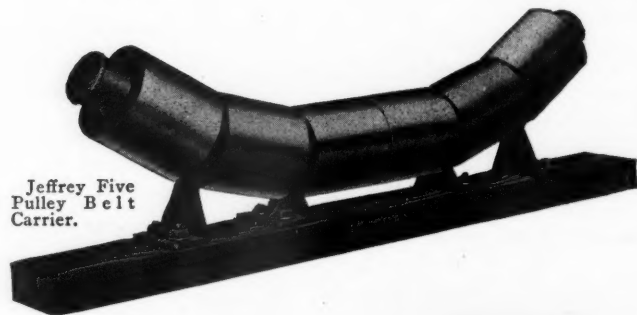
Jeffrey Standardized Belts, Carriers and Trippers are the result of years of close personal contact in building conveying equipment to meet all kinds of operating conditions, and therefore are a composite of the best of materials and practical engineering service.

Catalog No. 175-A has valuable data that every engineer, contractor or manufacturer should have. Write for copy.

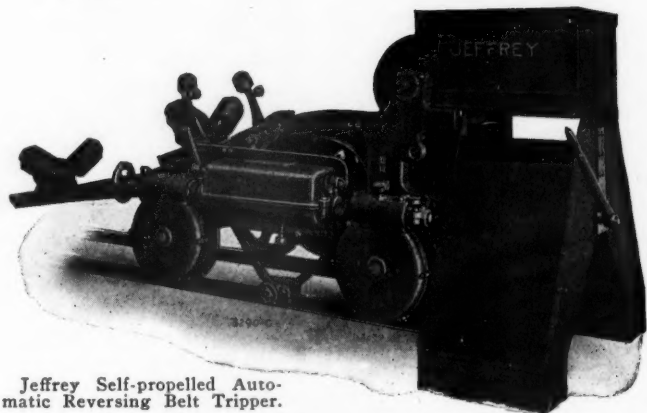
THE JEFFREY MFG. CO.
COLUMBUS, OHIO



Jeffrey Three Pulley Belt Carrier.
Can be mounted upon wood or steel stringers.

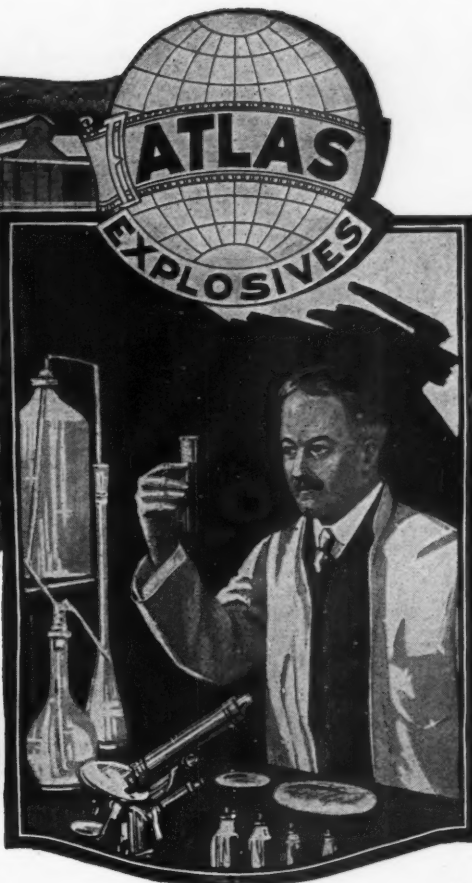
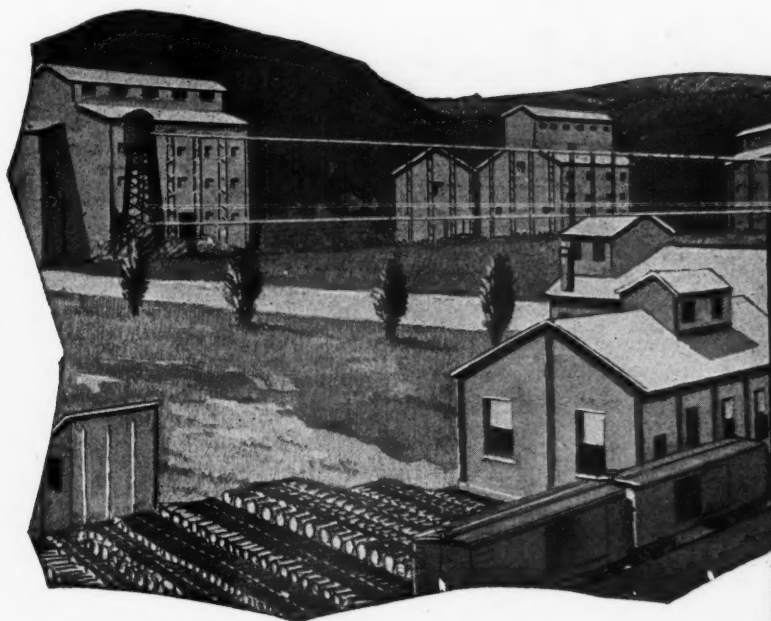


Jeffrey Five
Pulley Belt
Carrier.



Jeffrey Self-propelled Auto-
matic Reversing Belt Tripper.

Cooperation is the thing—please mention ROCK PRODUCTS.



TESTED

Every pound assures uniform blasting results

Our interest in our product does not end when it leaves our plants. That is when our *real* interest *begins*.

We want ATLAS Explosives to do more and better work in actual service. We want the blasting of our customers to be more efficient and more economical.

That is why our entire nation-wide organization is a unit for service to every man who has to do with blasting.

And that is why we maintain our own completely equipped chemical division to test ATLAS Explosives during the various processes of manufacture. Our tests guarantee every pound of our product. Absolute uniformity is thus assured. Absolute uniformity means absolute dependability. From the same type and grade of ATLAS like results are always obtained under like conditions.

Founded on this known uniformity ATLAS service is a sure cure for blasting ills. We invite every man interested in blasting to test this service.

Put your blasting problems up to us

Our Service Department is a clearing house of blasting experience in all its phases and under all conditions. It is directed by experts who will personally help you apply this vast store of information to *your own* blasting. WRITE TODAY.

ATLAS POWDER COMPANY

Home Office: Wilmington, Del.

Sales Offices: Allentown (Pa.), Birmingham (Ala.), Boston, Chicago, Des Moines, Houghton (Mich.), Joplin (Mo.), Kansas City, Knoxville, McAlester (Okla.), Memphis, Nashville, New Orleans, New York, Philadelphia, Pittsburg (Kan.), Pittsburgh (Pa.), Pottsville (Pa.), St. Louis, Wilkes-Barre (Pa.).

A PROPER EXPLOSIVE FOR EVERY BLASTING REQUIREMENT

Saying "I saw it in ROCK PRODUCTS" will bring quick action.

Building fleets for the Nation's shipping

Pierce-Arrows have played a large part in the war activities of the Nation—on the front in France and behind the front with the Expeditionary Force. And they have had an important part in war work over here.

The vital task of building ships to transport men, munitions and materials has employed them widely. The fleet of 21 Pierce-Arrows owned by the **Watson Construction Company** has helped signally in the building of the new ship yards at Hog Island, Pa., and on Newark Bay, as well as in navy work in New York and Boston. There has been no more important war work to do over here than speeding up ship construction.

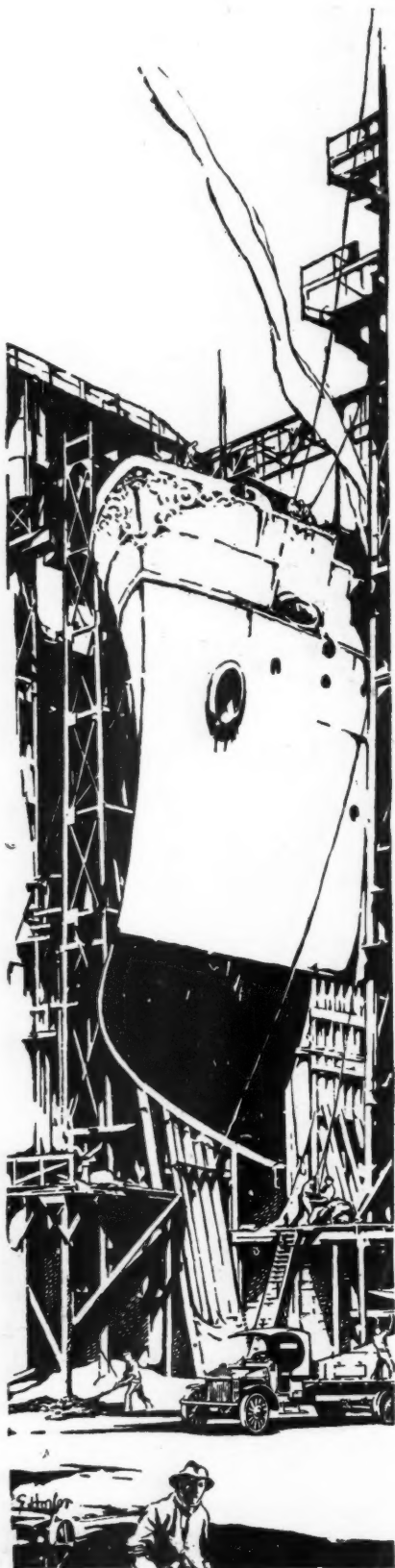
At the various munition plants, Pierce-Arrows have done their bit and at all the Army Camps, both in building cantonments and in carrying materials after the construction work was finished.

Reliability has been prime factor—and the ability to deliver a greater aggregate load in the least time. In this no truck shows so well as

PIERCE-ARROW *Motor Trucks*

Fleets of Pierce-Arrows attain maximum efficiency

For better service say "I saw it in ROCK PRODUCTS."



Building fleets for the Nation's business

Pierce-Arrows are playing their part in the business upbuilding of the Nation. In avoiding intolerable delays due to freight congestion their contribution has been important. In keeping open avenues of trade they help speed up production and provide the sinews of war for the military body.

In construction work incident to business maintenance their success has been tremendous. In this line, **the Watson fleet** has had many notable achievements, that emphasized uninterrupted service and the ability to deliver a greater aggregate of work in a given time than other trucks.

This capacity was demonstrated in building the Brighton Beach Speedway. There 8 Pierce-Arrows worked with three shifts of drivers 24 hours a day, hauling material from tidewater docks 6 miles away and averaging 125 miles a day.

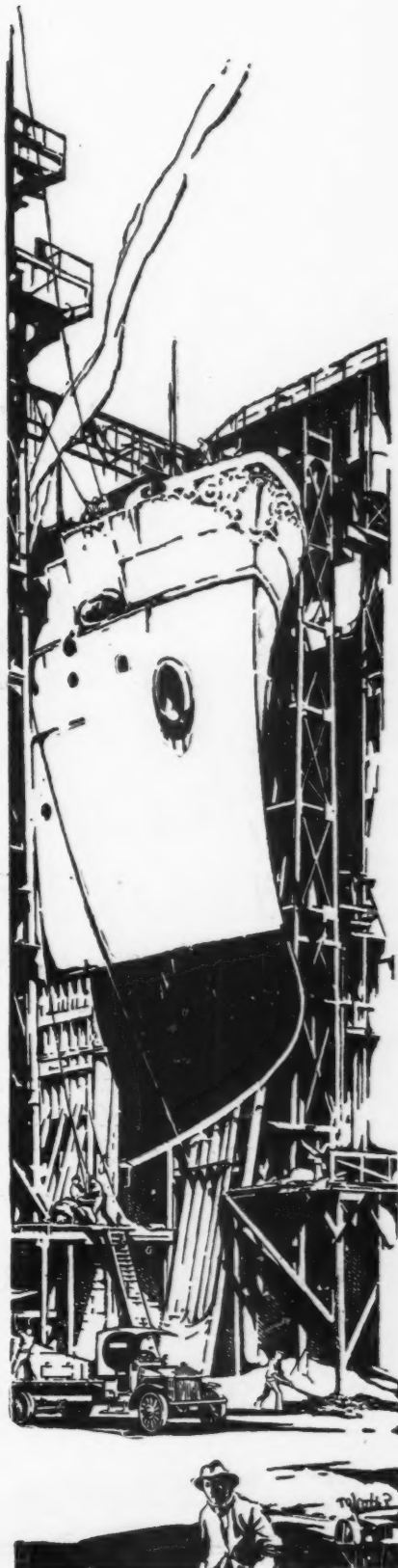
Again on a road filling contract at Unionport, N. Y., they handled material that ordinarily would have required a temporary railroad and hauling locomotives. Their cost was one-quarter the alternative cost.

In saving, conserving, speeding up work, no truck has made so good a record as

PIERCE-ARROW *Motor Trucks*

The Pierce-Arrow Motor Car Company, Buffalo, N.Y.

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.





The GREATEST MOTHER in the WORLD

holds a sacred place of honor within our homes and in our hearts

THE message that the American people stand as one behind our brave boys and gallant Allies, is the most cheerful "Merry Christmas" we can send them.

Let us make this a Red Cross

Christmas—let us see to it that every member of every family joins the Red Cross. She is warming thousands, feeding thousands, healing thousands from her store—the Greatest Mother in The World.

All you need is a Heart and a Dollar

RED CROSS CHRISTMAS ROLL CALL

December 16—23



Contributed Through
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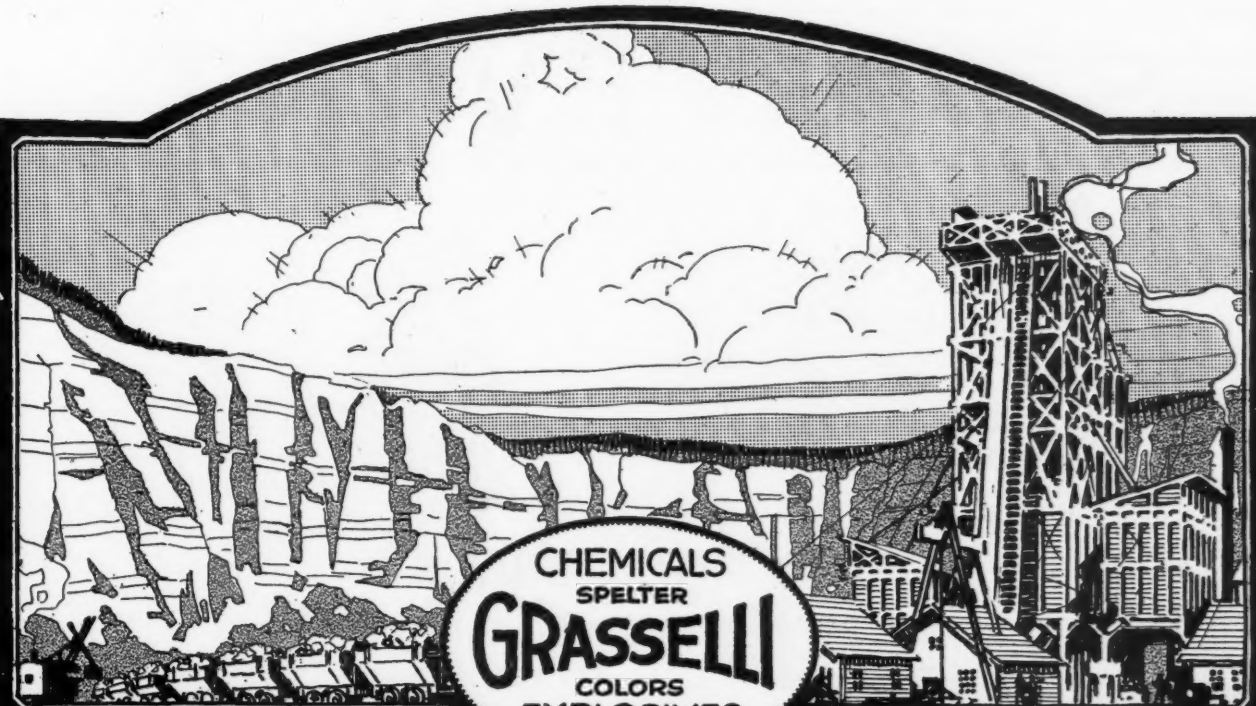


United States Gov't Comm.
on Public Information



This space contributed for the Winning of the War by

ROCK PRODUCTS



CHEMICALS
SPELTER
GRASSELLI
COLORS
EXPLOSIVES

GRASSELLI

EXPLOSIVES

THE position which Grasselli holds in its own particular field of endeavor is not the culmination of chance events or the result of artificial boosting.

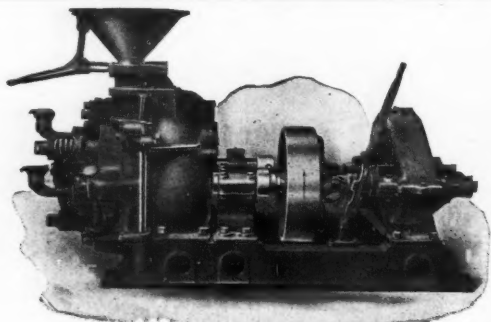
Meriting confidence, it is natural that its products have been of merit—for it is on merit alone that the "Grasselli" trademark has triumphed and established itself in the fore-front of the industry.

If you desire information regarding "Grasselli" explosives just write and your request will be given prompt and courteous attention.

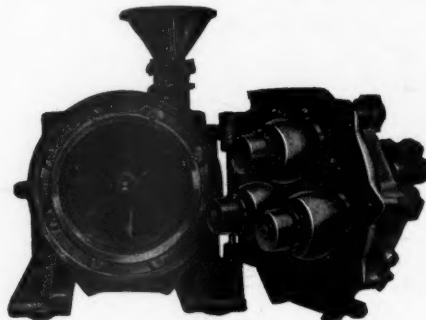
The Grasselli Powder Co.
CLEVELAND, OHIO

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

STURTEVANT



PATENTED



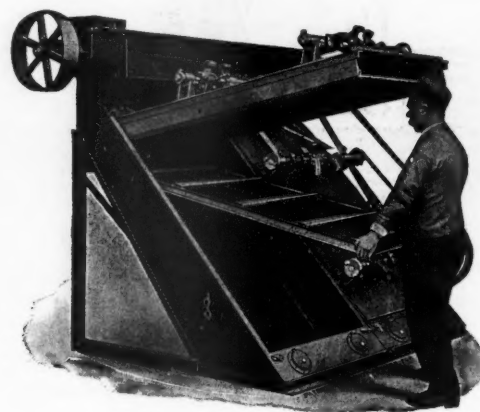
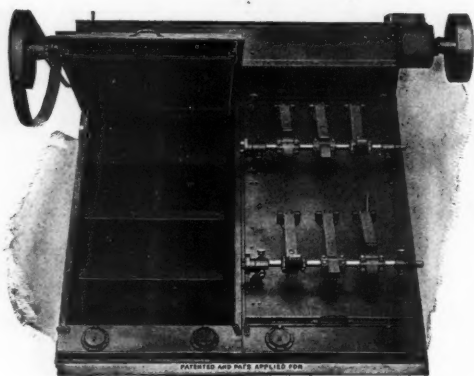
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RING-ROLL MILLS

The most durable and efficient grinder for hard and moderately hard rock or ore. Used for the reduction of Cement-Clinker, Limestone, Quartz, Ores, Granite, Trap, Phosphate, Coal, etc., etc. Hundreds in use. RANGE OF OUTPUT 8—100 MESH.

Construction—"Open Door" accessibility, every part within quick and easy reach. Nothing to get out of order or give trouble. Small power, slow wear. Built in single and Duplex Designs—compact and convenient, steady runners. BUILT IN FIVE SIZES.

Action—Material passes through hopper and is delivered on inner surface of concave, revolving ring, where it is held by centrifugal force. Three convex Rolls are strongly pressed against this centrifugally held layer of material and revolve by friction against it. The Rolls thus roll over the material, first crushing it and then wedging it off of both sides of the ring.



NEWAYGO SUPER-SCREEN

Unit Construction—Each unit has screens 6 feet by 3 feet and is a complete Separator in itself. Each part is interchangeable and of the most efficient size for vibrating, capacity, handling, repair, etc. By simply bolting units together a Separator of any reasonable capacity may be obtained.

The Vibration is truly wonderful and yet nothing comes in contact with the fine wire cloth, except the material being screened. Hammers jar elastic bridges far above the screen cloth, which transforms these shocks into high-pitched vibrations, when transferred to the wire cloth. The scalper is also vibrated.

Screen Cloth Tensioning—The screen cloth is stretched taut and held taut, and the tension may be regulated locally or in its entirety.

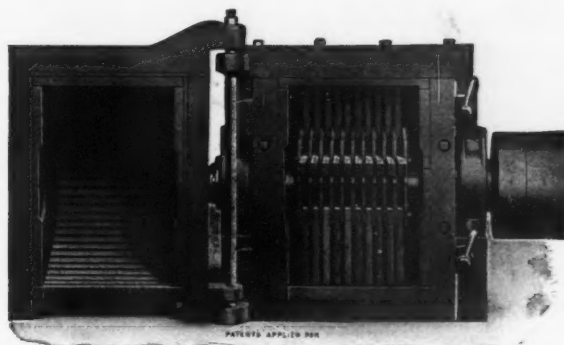
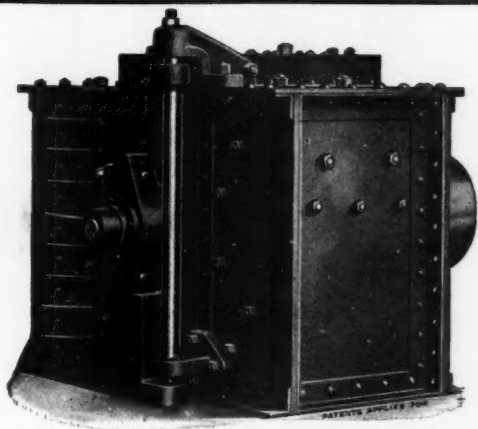
One Finger lifts the cover, and exposes the "Scalper" and Fine Screen. The "Scalper" slides into and is pulled out of the cover, like a drawer. The fine screen rests in the screen box, and is unobstructed by any mechanism, and is removed by simply lifting it out.

Accessibility, such as this, has heretofore been unknown.

STURTEVANT MILL CO.

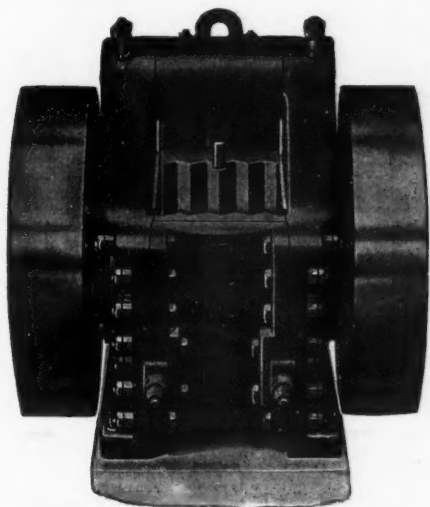
It gets immediate attention if you mention ROCK PRODUCTS.

STURTEVANT



OPEN-DOOR PULVERIZERS

One man in one minute can get at every part for cleaning, adjustment, repair or for the removal of iron. Shutting down a plant is costly—accessible machinery minimizes delay. It requires minutes instead of hours to get at any trouble with Sturtevant "Open Door" Machinery. Continuous operation means economy, large production, profits and small operating costs. Labor is scarce and of poor quality—most of it is eliminated by machinery, which seldom requires attention, and when repairs must be made, a simple and accessible machine pays for itself many times over.



JAW CRUSHERS

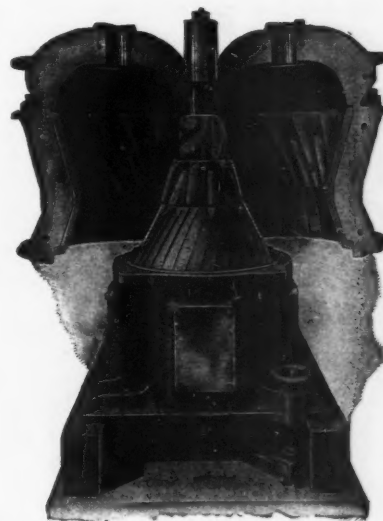
Action—Double Cam and Roll giving jaws two nips to each revolution of flywheels. Run at half the speed of others for same output. Slow speed means no hot boxes or bearing troubles and smooth, steady running—cheap foundations—long life.

Range of Output—6" to ½".

Uses—For crushing anything crushable, that is friable.

Jaw Sizes—2"x6", 4"x8", 5"x10", 8"x10", 6"x15", 10"x15", 6"x20", 12"x26".

Types—Coarse Crushers—Output: 2" to 6".
Intermediate Crushers—Output: 1" to 1½".
Fine Crushers—Output: ½" to 1".



ROTARY CRUSHERS

WITH OPEN-DOOR ACCESSIBILITY

Uses—For crushing large pieces of soft and moderately hard materials to 1" or to corn size and smaller. A most popular and widely used machine. Used largely as a preparatory crusher for Pulverizers.

Some of the materials being crushed in Rotary Crushers—Lime, Gypsum, Talc, Phosphate, Shale, Clay, Fullers Earth, Coke, Carbon, Chalk, Coal, Cement-Clinker, Sulphur, Caustic, Chemicals, Bauxite, Barytes, Oyster and Clam Shells, Colors, Facings, Brick, Salt, Soapstone, etc.

Sizes—Five. Capacities—½ to 20 tons per hour.

HARRISON SQ., BOSTON

Tell the advertiser you saw his ad in ROCK PRODUCTS. He'll appreciate it.

Traylor

MACHINERY and EQUIPMENT *for the* ROCK PRODUCTS INDUSTRY

JAW
CRUSHERS

GYRATORY
CRUSHERS

SHAKING
GRIZZLIES

CRUSHING
ROLLS

REVOLVING
SCREENS

COMPLETE
CRUSHED
STONE and
SAND &
GRAVEL
PLANTS

WHATEVER your needs, we have it. If you want equipment for the smallest or largest plant, we are prepared to serve you.

TRAYLOR JAW CRUSHERS

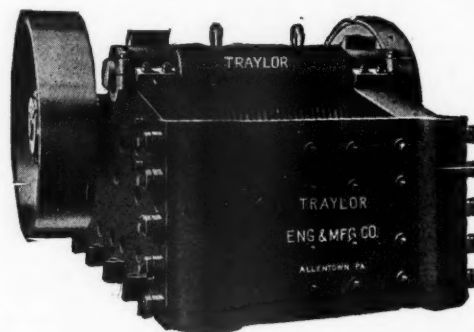
These dependable crushers, built for endurance and strength are made in five types and thirty-six sizes, ranging from the little 7x10" crusher weighing 8000 lbs. to the Giant Crusher weighing 680,000 lbs., with a jaw opening of 66x86".

Write for information

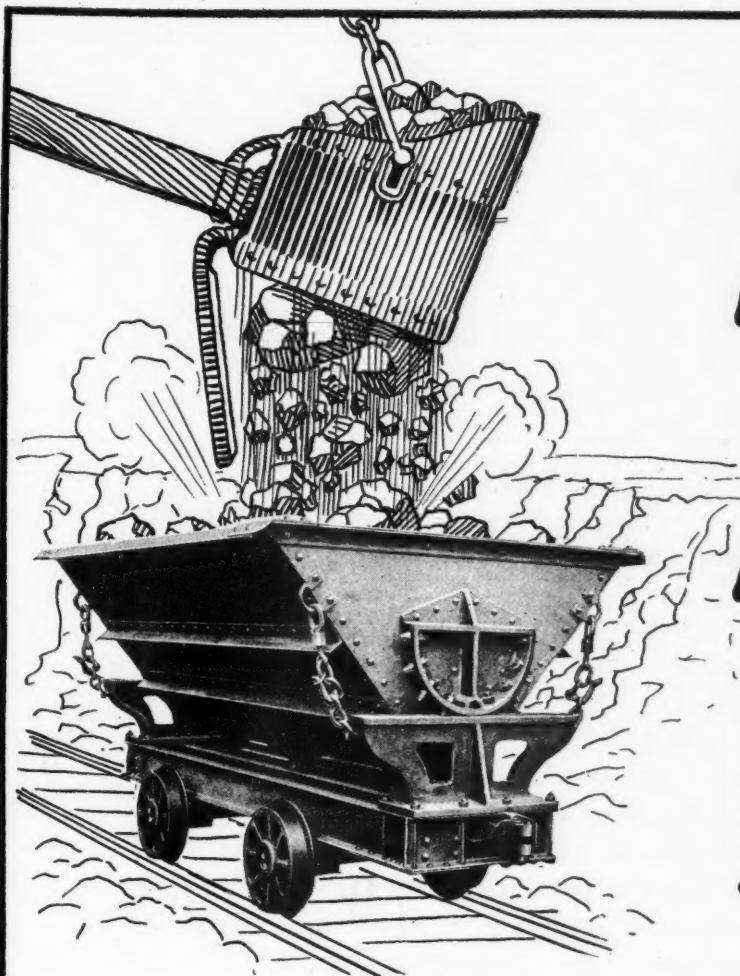
TRAYLOR ENGINEERING & MFG. CO.
ALLENTOWN, PA.

New York
Los Angeles

Chicago
Spokane



Prompt attention will be given your inquiry if you mention ROCK PRODUCTS.



Steam Shovel Loading

WATT Cars are constructed to withstand the extremely severe service test of steam shovel loading—at the same time meeting the individual requirements of each producer.

Your hauling problem is carefully studied by experts in our engineering department and a special Watt Car is built to suit *your conditions*.

Ask for our catalog today! It shows many designs we have constructed.

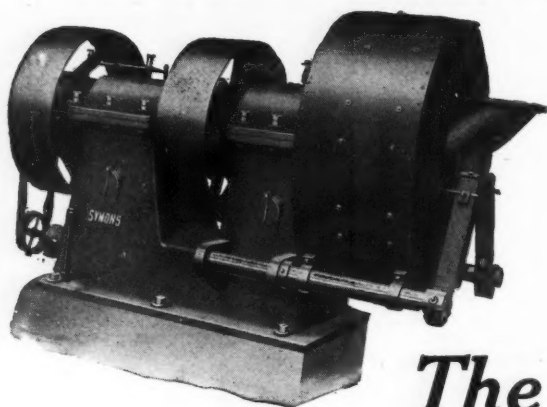
WATT MINING CAR WHEEL CO.
BARNESVILLE, OHIO

DENVER
Lindrooth, Shubart & Co.,
BOSTON BLDG.

SAN FRANCISCO
N. D. Phelps
SHELDON BLDG.

WATT CARS

When answering ads please give credit to ROCK PRODUCTS.



The End of the War—

introduces a new era of road construction and improvements never before equaled in the history of our country. Road work that has been neglected during the war because of material shortage and labor conditions will now progress with gigantic strides. The demand for crushed rock and gravel for road construction will tax the production capacity of every plant in America. The

Record of a 24-in. Crusher in the Field

**Material
Crushed:**
Gravel and
Hard Heads.

**Length of time
operated, 2
years.**

**Size of Feed, 2
in.**

**Size of Product,
½ in.**

**Horsepower
used, 20.**

**Tons crushed
per hour, 25.**

**Original crush-
ing discs still
in use.**

**No lost time ac-
count break-
age.**

*Superior to Rolls,
Jaw or Gyratory
Crushers on this
class of work*

SYMONS

DISC CRUSHER

"The Master Crusher"

is ready to help you meet these unusual conditions. Its installation in your plant means increased output—and increased output means a greater share of this new business for YOU.

Symons Crushers are economical in power consumption—excel in low repair cost and assure you of a uniform product at the lowest production cost.

Our catalog "R" describes them in detail. Write for it today!

Manufactured Under Exclusive License and Sold Only by

CHALMERS & WILLIAMS

1425 Arnold Street, Chicago Heights, Illinois

Rock Products

Vol. XXI

Chicago, December 4, 1918

No. 16

The Use of Lime in the Industries

Production Statistics for 1917 Show Importance of this Field of Lime
Manufacture

THE CONSUMPTION OF LIME by chemical works, paper mills, sugar factories, tanneries and glass factories in 1917 was 1,513,330 tons, or something like 200,000 tons more than was used for building purposes. Of course 1917 was a year of abnormally low demand for building lime so that the comparison is not so significant as would appear at first glance. It is interesting however in showing the tremendous growth in the demand for lime in other industries and especially in the chemical industry, where the consumption of lime has more than doubled since 1914.

Much of this new demand has of course come from the development of the coal-tar by-product industry in this country which was the direct result of shutting off German imports. The immediate impetus to the establishment of an American coal-tar by-product industry was the demand for military explosives. But this industry is not destined to end with the ending of the war because the works and equipment used to manufacture modern explosives are practically identical with those of the coal-tar dye industry. Thus Germany on the one hand built up an immense dye industry in order to be prepared for making explosives on a wholesale scale, while this country on the other hand has built up an immense explosives industry to be converted into a dye industry which will forever put an end to Germany's previous monopoly. In 1917 there were already established in this country 190 firms (exclusive of coke-oven plants and gas houses) which re-

ported the manufacture of coal-tar chemicals.

Lime is largely used in the preparation of what are called intermediates. Intermediates are substances which do not exist in coal tar as such but are made from the crude products by chemical processes. Intermediates are themselves of use only for further manufacture by additional chemical processes into finished products such as dyes, medicines, photographic chemicals, perfumes, flavors, synthetic tanning materials, etc.

This is a field of chemistry which is growing by leaps and bounds, new finished materials and new uses for all materials are being developed almost daily. At present almost all these chemical works are in the congested area of the Atlantic seaboard, between New York and Washington. However,

every gas plant and every coke oven may be made to furnish the raw materials and it is only a question of time when the industry will be country-wide.

All lime manufacturers are therefore interested, even though remotely situated as regards the present chemical plants. There is also another side to the industry which is of interest to lime manufacturers and that is the quality of the lime necessary or desirable for the coal-tar industry. It is quite possible that the manufacturer of an exceptionally pure product will find a market far beyond his market for building lime. Again it is quite possible that we shall soon see manufacturers of lime specializing on lime for particular chemical purposes.

Lime in the Industries

WITH THIS ISSUE of Rock Products is begun a series of articles on the use of lime in the industries.

This issue contains a particularly valuable article on the use of lime in the coal-tar by-product industry—the first literature on this subject to appear in an American periodical.

Depletion Allowance for Stone Quarries, Sand and Gravel Pits

If Objection Is Made to Adequate Depletion Allowance Call It an Exigency or Emergency Allowance—The Lure of Volume

IS IT THE TERM Depletion Allowance that you object to? If it is we will call it an exigency or emergency charge—an insurance premium against unforeseen troubles, and against the gambling element of doing business.

In the discussion of depletion in *ROCK PRODUCTS* of October 23 and November 6 perhaps too much stress was laid on the term depletion. The Minnesota and Michigan iron-ore operators charge 77 cents per ton to their production costs to cover depletion. This depletion charge represents the value of the material in place. It was originally based on their profit per ton of ore; therefore it includes their profit. Nevertheless they successfully contended it should not include all their profit.

Object of Cost-Keeping

We keep costs for two purposes: (1) To know what we get for the money spent, and (2) to have a sound basis for a selling price. The unit costs arrived at for these two purposes are not necessarily identical. In the case of the iron-ore producers obviously they cannot be identical.

This seems to be the stumbling block in all the discussion on depletion of quarries and gravel pits. The object of making an adequate depletion charge is not to delude the operator into thinking he has spent that much money, it is merely to provide a safety allowance for emergencies which he cannot foresee—unprovided for breakage, loss of business through strikes, loss of market, sudden change in character of deposit, etc.—an insurance against gambling elements which is required in any business that has any claims to permanence.

In so many words, such a charge—call it what you will—is to prevent operators from competing and price-cutting on too narrow a margin—from skating on too thin ice. Practically all operators see the need of such an allowance, so the name it should go by is immaterial to the real point of the discussion. Call it camouflaged profit if you will. We prefer the term depletion, partly because an adequate depletion charge is easily justified and because some have already formed the habit of including some kind of a depletion charge in their cost-keeping methods, and partly because the iron-ore miners have gotten away with a 77-cent per ton depletion charge under identically similar circumstances. If iron ore is worth \$4.50 a ton delivered at lake terminals and crushed stone under the same conditions is worth \$1.50 a ton,

a 77-cent depletion charge on the ore justifies one-third of 77 cents or 25 cents a ton depletion charge on the stone, according to our point of view. It is presumed, however, that no stone man would have the nerve to ask that as a beginning, so 10 cents was suggested in *ROCK PRODUCTS* of October 23. In the light of all the circumstances, that did not look extravagant.

R. W. SCHERER, Secretary of the Wisconsin Crushed Stone Association, Milwaukee, Wis., Writes:

John Rice in *ROCK PRODUCTS* of November 6 sums up the question completely and thoroughly. To place an intrinsic value on a stone deposit or royalty contract is like demanding for an egg its potential value as the progenitor of untold generations of profitable poultry. A stone deposit, like

DISCUSSION of depletion allowance is bringing out some interesting views. What are yours? Your contribution to the subject will be welcomed.—The Editor.

an egg, needs a lot of hatching and raising, and in place is worth no more or less than it can be duplicated for.

Still there are eggs and eggs and quarries and quarries. It is conceivable that a limited deposit in the heart of a metropolitan district, where location gives the product an advantage of 30 to 40 cents per ton and where competitors must and do absorb this differential, should be valued in place. And yet, when the owner finds that he cannot collect the 30 cents differential, he takes 20 cents, or, "to keep body and soul together" as Mr. Rice puts it, he ignores it.

It is also possible when a deposit has been prospected and is of superior merit, cannot be duplicated in that market, that the prospector or developer should be rewarded for his find by placing an additional value on the material in place—but that reward must also be collected in a market where gruelling competition has been the rule.

The cause for this fierce competition must be sought, not in the fact that operators are inclined to ignore some more or less fictitious depletion charge, but principally in the fact that volume of business reduces ton-costs. Preach and write as

we will against "volume business" no one is deceived. There is not an operator who would not rather accept an order for his season's capacity, say 300,000 tons at 75 cents than one for 150,000 tons at a dollar, depletion charge or no depletion charge.

Over-Estimating Effect of Volume

In attempting to ameliorate this fierce competition, it does no good whatever to ignore the lure of volume. We should rather figure with it and keep cost accounts to show what volume does to ton-costs. In the analysis it may be shown that it has been over-estimated oftener than under-estimated. A depletion charge would, of course, raise ton-costs directly but, it is to be feared, is seldom justified. Such an analysis of costs is possible in any operation, from data usually at hand in any quarry office and is illuminating to say the least. It will answer the all-absorbing question: "How much, in a plant already operating, will additional tons cost?"

Over-estimating the effect of volume on ton-costs is probably the most fruitful source of ruinous competition, more fruitful than in the manufacture of any other staple of commerce because crushing plants can be and are operated at much less than their capacity, the fluctuating demand and lack of storage making such operation unavoidable. But essential charges are often overlooked. If Mr. Rice's method of charging depreciation, which is perfectly just and equitable, were universally adopted, stone prices would range higher in many markets.

Considering the venturesome character of any undertaking in stone-crushing, a handsome premium should be the reward of success in the shape of something more than the prevailing rate of interest on securities and no operation can be said to be successful unless it can collect such a reward.

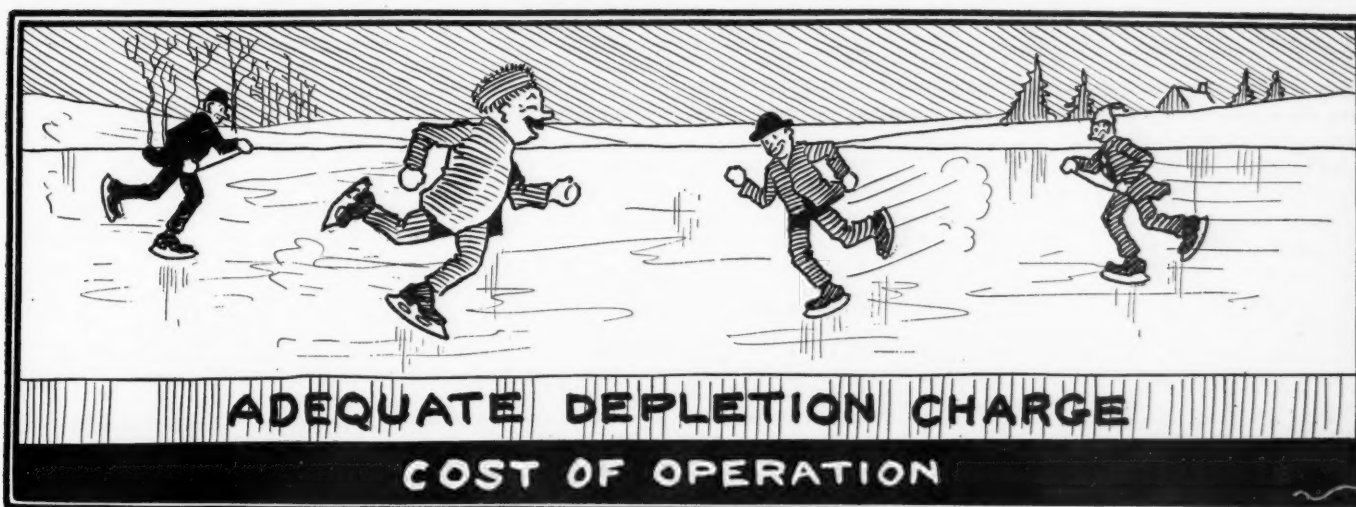
Breakage Allowance

In the discussions on cost accounting there has been no mention made anywhere of another charge that is justified and necessary. Over and above plant depreciation some operators charge off a definite amount monthly or annually to provide for a big breakage, past or to come. Accidents involving injuries to employees or the public are provided for in liability insurance. And still accidents can happen and do happen to machinery that often involve 10 to 30 per cent of the operator's resources. If

Which Do You Prefer?



THIS KIND of competition, or



THIS

one could insure against breakage, the charge would not be questioned as a legitimate one. Since insurance is not to be had the operator should carry his own safety margin by creating a breakage fund. Without such a fund, profits are a matter of luck and profits shown in a lucky month or season are fictitious, unless, out of them an adequate sum has been set aside for the big breakage that is sure to come. And all of this is in addition to care and upkeep of machinery and in addition to depreciation. Besides gradual deterioration, crushing machines, new or old, are liable to breakage.

Breakage Account

The rate of charging off on such a breakage account depends greatly on the character of the operation; if there are many machines of the same size, one might expect to get a normal share of breakage in each season, but if one essential machine represents a considerable part of the investment the possibility of its breaking should be provided for in lucky seasons; chance

should be eliminated. It will be found that such a charge is recognized in law in addition to depreciation, if the rates of both are reasonable, depending on the character of the stone and the past performance of similar machines. Certainly breakage enters into the ultimate cost of crushing stone but it is not often considered in the selling price.

Uniform cost accounting, if it is possi-

ble, would go a long way toward educating operators to a more dignified conception of the industry. But cost accounting that does not eliminate the one big variable factor—volume—is valueless. That variable can be eliminated, its effect on ton-costs can be accurately determined and the knowledge would stop some operators from gambling on the volume of business that they are going to get.

Last Price-Fixing on Stone by War Industries Board

WASHINGTON—What was said to be the last price fixing action by the War Industries Board, unless in the event of unusual and unforeseen circumstances, was announced November 15 and the Philadelphia and Delaware territory only is affected by the new order, which was agreed upon November 7. Under this order a maximum price of \$1.50 per ton of 2000 pounds f. o. b. cars, at the plant, was fixed on all government purchases of

crushed stone, other than railroad ballast or screenings, for the period ending December 31, 1918. The operation of the order is limited to Pennsylvania, east of and including Harrisburg, Delaware, and New Jersey south of and including Trenton. Signs were not lacking that a large amount of cement and road work projected for this territory was going to cause an abnormal advance in price of crushed stone and therefore the government acted to prevent it. It is not believed the price will be insisted upon after the period indicated.

General Contractors Form Association

Are Fully Alive to Benefits of a National Organization in Spite of Fierce Competition

AN INDICATION of the after-war spirit of co-operation was the formation in Chicago, Nov. 20 and 21, of the Associated General Contractors of America. That the need for co-operative effort through associations should end with the war was the thought farthest from the minds of the two hundred contractors who met to form this first national association of contractors. Not that they should organize to save themselves in times of adversity, but that they must organize to reap the full benefits of the great era of prosperity, which they all believed was imminent, was the thought constantly expressed.

Local Associations Strong for National

Many of those present came as delegates from strong local associations, such for instance as the General Contractors' Association of New York. The striking thing about the attitude of these men was their enthusiastic support of the movement for a national organization.

There is a lesson in this for the sand, gravel and crushed stone producers because in many ways they are in a similar position to the contractors. Like contractors, as D. A. Garber of New York—one of them—said, they have the reputation of being cut-throat competitors, and very reluctant to admitting that the other fellow or other fellow's work had any virtues. Certainly if contractors can fraternize and work together for a common end, there is no excuse for material men failing to do so.

Objects of Their Association

Most of the purposes of the new contractors' organization could be promptly subscribed to by material men as well. As stated in the constitution they are:

The objects of the association are to promote better relations between private owners and public bodies, their architects or engineers on the one hand, and contractors on the other; to maintain high professional standards in the conduct of work; to combat unfair practices; to encourage efficiency among contractors; to support contractors and contractors' associations in efforts to rectify conditions of an unsatisfactory character; to encourage those methods of contracting for work which relieve the contractor of improper risks, and to encourage sound business methods tending to raise the standing of contractors generally in the business world.

Among the other points made in the addresses of various members were the prospect of working jointly with the American Society of Civil Engineers and similar organizations in revising specifications and contract forms with the object of removing some of the unfair practices the contractor now suffers under; to be able to have a

joint labor policy and not to be so completely at the mercy of labor unions; to influence legislation or at least prevent legislation inimical to the contractor and in the end to the public; to work out some system of uniform cost-keeping; and last, but not least, to develop the good-fellowship side of their association so that they would come to know one another as something else than cut-throat competitors.

For Contractors Only

Nothing was said as to the effect of such an organization on material men who supply contractors, but it was made evident many times that material men were not wanted as members. In fact, the present membership of material men in local Building Exchanges was an obstacle to absorbing these exchanges into the national organization.

The requirements for membership read as follows:

Only general contractors, either individuals, firms or corporations, who have been engaged for at least two (2) years in general contracting prior to applying for membership in this association, or who have established a reputation for skill, honesty and responsibility, shall be eligible for membership. They must also undertake work in its entirety, partly at least with their own construction forces.

Members of the association must be associated organizations of general contractors, individuals, firms or corporations engaged in general contracting. Only such members of associated organizations as fulfill the above requirements shall have voting representation in this association.

The membership dues were placed at \$100 per year for the first year for individual firms. Members of local associations can come in for \$10 per year provided the aggregate for their local association amounts to \$100. The affiliated associations have one vote for each 10 members. It was announced by the Finance Committee that it was the ultimate intention to have a sliding scale of annual dues based on the amount of work done per year by each member or graduated to the annual payroll.

The government of the association is in the hands of an Executive Board, which consists of the President, three Vice-Presidents, Treasurer and twelve Directors. The Secretary is the executive officer of the Association and is an employee.

Notable Addresses

The business sessions of the convention were interspersed with addresses by Brig-Gen. R. C. Marshall, Jr., Chief of the Construction Division of the War Department; Col. William A. Starrett, Chairman of the Committee on Emergency Construction of

the War Industries Board and Harry A. Wheeler, President of the Chamber of Commerce of the United States. Remarkable expressions of idealism were features of these talks, particularly those of Colonel Starrett and Mr. Wheeler.

Contractors were warned that co-operation as between themselves was not sufficient. If their object was so materialistic as to want a club to use on labor and legislation, their organization then was threatened with failure, said Mr. Wheeler. They must approach the labor problems and other big problems of the times with a spirit of toleration and sympathy, he said.

The labor problem received considerable attention in all the addresses. There seemed to be no other opinion but that wages must return to normal but how soon or by what means no one hazarded a guess. Every one was very optimistic of the future of construction work.

Officers Elected—Platform Outlined

The following were the unanimous choice of the convention for permanent officers for the ensuing year:

President, D. A. Garber of New York; first vice-president, W. A. Rogers of Chicago; second vice-president, T. T. Flagler of Atlanta; third vice-president, J. W. Cowper of Buffalo; treasurer, C. F. Mullen of Cleveland.

The following were elected members of the Board of Directors: For one year—N. F. Hoggson of New York, F. J. MacIsaac of New York, C. W. Gompertz of San Francisco, George Watson of Dallas; for two years—Richard Porter of Portland, Ore., A. P. Greensfelder of St. Louis, Edward Haupt of Chicago, Thomas Bentley of Toledo; for three years—E. J. Thomas of Memphis, L. C. Wason of Boston, M. D. Smith of Detroit, H. B. Hangar of Richmond, Ky.

Platform of Convention

The Associated General Contractors of America hopes to be the means by which the impulse to progress noticeable here and there in the past may be crystallized into a movement which will lift one of the largest industries in the world to the highest plane.

In order to accomplish this object it will be necessary to maintain an efficient organization to study all branches of the industry and to disseminate both by literature and personal counsel the best information obtained.

It is assumed that this can be best done under the following headings:

First—Ethics.

Second—Mutual aid.

Third—Co-operation with other associations.

Fourth—Protection.

Fifth—Proper publicity.

1. A proper code of ethics will establish this industry in its rightful professional place. The standard of membership in this organization should be so high that it guarantees to the general public "skill, honesty and responsibility."

2. By mutual aid we mean the exchange of information concerning proper cost accounting, reliable estimating, fair and reasonable allowances for depreciation of plant, conditions covering rentals and terms as applied to equipment, etc.

3. By co-operation with other associations we aim to maintain contact with commercial, engineering, architectural or other organizations.

4. Protection is often needed and should be furnished individual members against conditions arising from unfair legislation, bidding conditions, competition, specifications, plans, contracts, supervision and unfair labor conditions.

5. Publicity by suitable mediums is essential for the well-being of the organization and should aim to reach the public generally to create a sentiment of fairness and appreciation for the services rendered by the members of this organization.

Prospect for Immediate Building Good Says Dodge Report

A CANVASS conducted by the F. W. Dodge Co., in New England, the Middle Atlantic States and the Middle West, though limited in extent, for the sake of accuracy and promptness, disclosed \$450,000,000 worth of projected construction ready or about ready, so far as plans and specifications are concerned, to be released. How much there is in the country it is impossible even to estimate.

The projects, as one might expect after years of underbuilding, are extremely varied in character—factories, office buildings, apartment houses, residences, hospitals, schools, churches; every class of construction is numerously represented.

We have the assurance of the War Industries Board that it is physically possible to go ahead. "From the best information obtainable," reads a statement by the Board, "we believe that there is now available sufficient labor, fuel, transportation and building materials to warrant the withdrawal of all restrictions on building projects."

If, therefore, owners fail to let contracts promptly, it will be either because of high cost of construction or difficulty in obtaining loans.

With respect to loans, we believe that bankers will share the Government's desire to see the building industry revive in order to furnish employment to labor. In all probability it will be easier to obtain

capital now than it will be later when commerce and the manufacturing industries have expanded and when huge credits have been established for economic reconstruction abroad, says the Dodge report.

With respect to cost of construction, there are two important modifying circumstances. In the first place, after years of underbuilding, there will be many constructions that must proceed regardless of some possible saving through delay, for example, hospitals, schools, public buildings, private dwellings etc., which are not treated as investments. Factories and stores also come under this head in so far as the determining factor is not cost of construction, but prospective business profits. In the second place, in the case of investment buildings proper, high rents and depressed land values, as well as burdensome taxes on unimproved real estate, counteract the high cost of construction.

No one assumes that the union scale of wages in the building industry is going down in some years. Nor does anyone ex-

pect that building material prices will go down to where they stood before the war. Hence, all things considered, many owners will unquestionably decide that it is more advantageous to build now than to wait.

Texas Ready to Go Ahead On Road Construction

AUSTIN, Tex.—Now that the United States highways council has removed all restrictions as to the use of road building materials in Texas it is expected that many long deferred highway projects will be carried out. It is also thought that the difficulties that have been met with in the sale of road and other public improvement bonds will be no longer encountered.

"There is plenty of material in Texas which may be used for the work," said Engineer Geo. A. Duren, state highway commissioner, "and besides those counties which have been contemplating the issuance of road bonds may now proceed unhampered by any restrictions."

Reconstruction Committee on Highways

WASHINGTON, D. C.—The Highway Industries Association, which is calling together, with the co-operation of the American Association of State Highway Officials, one of the greatest conventions ever held, at the Congress Hotel, Chicago, Ill., Dec. 11 and 12, announces that a War Service and Reconstruction Committee of the Highway Industries has been formed with the co-operation of the Chamber of Commerce of the United States.

This new War Service and Reconstruction Committee will take part in the general conference of War Service and Reconstruction Committees of American Industry, to be held at Atlantic City, N. J., beginning Dec. 2, under the auspices of the National Chamber, the week preceding the great highway convention in Chicago.

S. M. Williams, president of the Highway Industries Association, has appointed the following members of the War Service and Reconstruction Committee upon Highways:

Representing the Highway Industries Association. Their Executive Committee, as follows: W. T. White, Cleveland, Ohio; A. N. Johnson, Chicago, Ill.; W. P. Blair, Cleveland, Ohio; A. P. Sandles, Columbus, Ohio; A. R. Hirst, Madison, Wis.; E. J. Mehren, New York, N. Y.; S. T. Henry, Washington, D. C.; H. G. Shirley, Washington, D. C.

Representing the American Association of State Highway Officials. Their Executive Committee, as follows: Lt.-Col. W. D. Uhler, Washington, D. C.; G. P. Coleman, Richmond, Va.; W. G. Thompson, Trenton,

N. J.; J. N. Mackall, Baltimore, Md.; C. F. Stern, Sacramento, Cal.; P. D. Sargeant, Augusta, Me.; W. S. Keller, Birmingham, Ala.; Ira L. Browning, Salt Lake City, Utah; E. A. Duffey, Albany, N. Y.; Max L. Cunningham, Oklahoma City, Okla.;

Representing the American Automobile Association. Their Executive Committee, as follows: David Jameson, president, New Castle, Pa.; A. E. Batchelder, executive chairman, Washington, D. C.; Carl J. Fisher, chairman, Touring Board, Indianapolis, Ind.; Geo. C. Deihl, chairman, Good Roads Board, Buffalo, N. Y.; Eugene Burton, chairman, Legislative Committee, Newark, N. J.

Representing Highway Transport Committee, Roy D. Chapin, chairman, Highway Transport Committee, Washington, D. C.

Representing the Office of Public Roads, L. W. Page, director, Office of Public Roads, Washington, D. C.

State Colleges Advising Farmers on Lime

NO LESS THAN 25 State Agricultural Colleges have issued news articles to the rural press giving publicity to the removal of restrictions on agricultural lime by the War Industries Board and advising use of the sweetener at once.

The weekly report of coal supply rendered jointly to the State and United States Fuel Administrators and on the post card form G will be continued.

Secretary of Agriculture As Good Roads Advocate

Agitation to Have His Department Take Over Certain Road Work
Evidently Having Some Effect

WASHINGTON, D. C.—The following is sent out officially by the Department of Agriculture: Coöperative highway construction under the Federal aid road act must be resumed as quickly as possible in full measure, the Secretary of Agriculture, D. F. Houston, stated at a conference of editors of agricultural journals held recently in Washington.

From unexpended balances of Federal appropriations for the last few years, from State funds beyond what was necessary to meet the Federal allotments, and from amounts available during the current fiscal year, approximately \$75,000,000 will be available for expenditure during the calendar year. Next year, if all the balances should be expended during this year, and we should have to rely solely on the funds accruing next year, there will be about \$200,000,000 from Federal appropriations, and probably more than this amount from State sources, according to the Secretary's statement. The States, in addition, will expend sums in excess of what they have assigned, or will assign, for Federal aid road projects.

"It seems to me," said the Secretary, "that we should take a further step—take this step not only because of the importance of good roads, but also because of the desirability of furnishing worthy projects on which unemployed labor during the period of readjustment may be engaged. There will be many things suggested for which Federal and State funds will be sought. Some of these will be unworthy. Clearly such public works as roads are worthy, and it would be in the public interest to make available larger appropriations from the Federal Treasury to be used separately or in conjunction with State and local support.

"There need be no delay in the execution of such a program. The nation has already provided the machinery in the Department of Agriculture and in the State highway commissions. The Federal aid road act was fruitful of good legislation, and each State in the Union now has a central highway authority with power and funds to meet the terms of the Federal act. The two agencies, in conjunction, have been engaged in devising well-considered road systems and in making surveys, plans, and specifications. The task will be one of selection, and those roads should be designated for improvement which are of the greatest economic importance, with due regard to such military and other needs

as are proper for consideration. There is no necessity for any departure from this scheme. The suggestions made have been canvassed with the President, the Secretary of War, and the Postmaster General, and they are in accord with the view that additional funds should be made available to this department and that they should be expended through existing machinery."

Don't Forget the Chicago Road Congress!

EVERY indication points to a record road-building year in 1919. To talk over the situation and make plans for next season the largest meeting of men interested in road building ever assembled will take place in Chicago, December 11 and 12. It is the first American Road Congress at which associations of material men will receive official notice. Hence it behooves every road material man to make a special effort to be on deck. There will undoubtedly be unofficial meetings of sand and gravel and crushed stone men, at which much may develop of interest to the development of the industries. This will be the one big opportunity to get a line on the Road Programs for 1919. Don't miss it.

Work is Ordered Resumed on Public Buildings

THE SECRETARY of the Treasury has authorized the following:

In December last, owing to the pressure of war conditions and the consequent necessity of concentrating the industrial power of the nation on the manufacture of war material, I deemed it essential to direct the Supervising Architect of the Treasury Department to discontinue all construction work on public buildings except such as was absolutely necessary and to refrain from inviting bids for new work.

The changed conditions brought about by the conclusion of the armistice and the manifest inability of Germany to renew the conflict, emphasizes the importance of resuming, with as little delay as possible, the normal industrial activities of peace. Construction work, which has been delayed because of the necessities of war, should now be resumed, and I have, therefore, instructed the Supervising Architect to in-

vite bids for the construction of new buildings and extensions authorized by the Congress.

Among the first moves of the Treasury Department, in pursuance of the new policy of the resumption of building operations, will be to take up, with the commission appointed by the Congress for that purpose, the question of constructing an archives building in Washington. The necessity for such a building has been greatly increased by reason of the need of adequately safeguarding the large mass of valuable records and documents relating to the war.

The resumption of construction work by the government will contribute toward facilitating the industrial transition of the country from war to a peace basis, and should serve to encourage others to undertake without delay the fulfillment of the many and varied industrial peace needs.

No More Priorities Except for Government Work

WASHINGTON—To hasten the restoration of normal industrial conditions, the War Industries Board has decided that there shall be no automatic priority ratings except for work under the control of the Government.

It had been planned by the Priorities Division to retain a series of automatic ratings for civilian purposes, but the War Industries Board overruled the Priorities Division program.

This required a complete revision of the tentative draft of Circular No. 58, which had been made up to carry a series of such civilian preferences.

Applications for priority certificates may still be made, but will be granted only when the need is urgent and where it is clearly in the public interest. Nevertheless the Priorities Division, under the new order, not only recognizes the paramount needs of the Navy, Emergency Fleet Corporation, railroads, telegraph and telephone companies, but urges the industries of the country without resort to priority assistance to speed up the production and delivery of orders for the repairing of public utilities, manufacture of farm implements, and equipment for the production and distribution of food, petroleum and natural gas pipelines and other facilities; and the operation, repair, maintenance or expansion of mines, coke-oven plants, ore reduction plants, smelters and furnaces employed in the production of fuels, metals and metal products.

The War Industries Board has made one important reservation. Under this the Priorities Division will have the power whenever an urgent necessity "in the public market" demands, to promulgate "such rulings and make such suggestions and requests in connection with priorities in the production and supply of fuel, electric energy, labor and transportation as changing conditions may require."

Blake Bros. Co. Quarry, San Francisco Bay

Crushed Stone Bunkers
Carved in Rock Hillside
Self-Unloading Barges

By M. A. Baudin

THE BLAKE BROTHERS CO., which has offices in San Francisco, Calif., owns and operates a large rock quarry located near the town of Richmond on the Bay shore, about ten miles across the Bay from San Francisco. The quarry is elevated about 200 ft. above sea level and has a face about 300 ft. high. On account of the great height of the face, the average cost of blasting is very moderate.

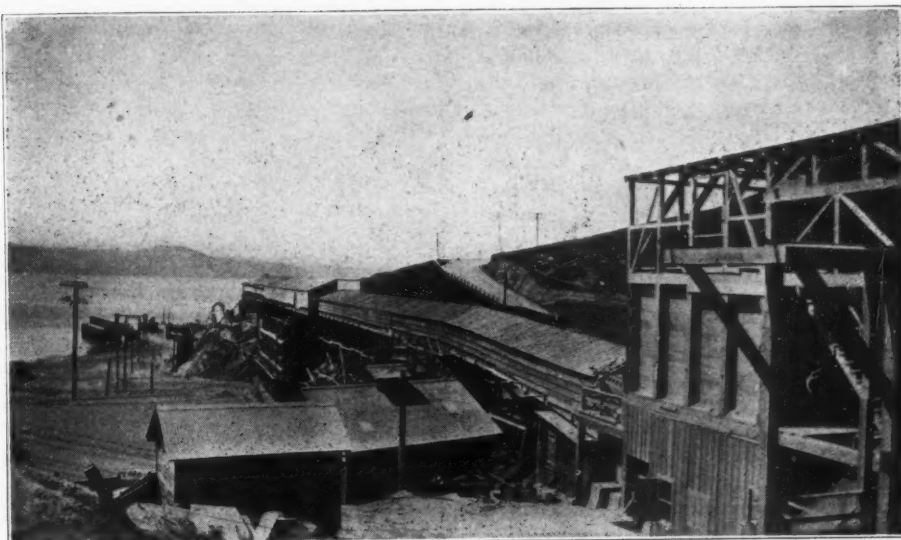
The holes for the blasts are drilled on an average to a depth of about 22 ft. with compressed-air drills and in some cases drifts are made (better known as coyote holes). The last one fired was tunneled into the cliff 60 ft., double-teed, and was loaded with nine tons of powder, which broke down about 65,000 to 70,000 cu. yd. of rock. All rock too large to handle are plug-drilled with compressed-air hammer drills and blasted.

Two steam shovels are operated in the quarry. Each has a dipper capacity of $\frac{5}{8}$ cu. yd. Both bottom-dumps and side-dump quarry cars are used. These cars are handled in the quarry by two 8-ton steam locomotives. A 10-ton steam locomotive hauls the rock on a slight grade about a thousand feet over a trestle. The rock is dumped into receiving bins and then is fed by gravity to two No. 6 gyratory crushers, which are run by 75-h. p. electric motors.

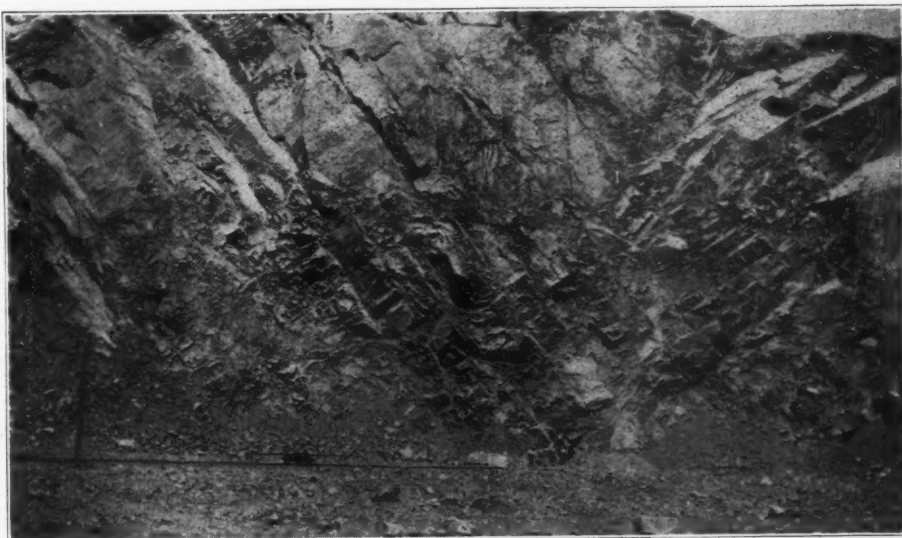
The rock from each crusher is raised by bucket elevators to separate screens equipped to produce three sizes of rock. The tailings from both screens are fed to a No. 4 gyratory crusher. From there the crushed stone is raised by a bucket elevator to the sizing screens. The tailings from these screens are run into two No. 3 gyratory crushers. From these crushers the rock goes back on a 16-in. conveyor and dumps into another elevator to the screens and then to the storage bins. From these bins the rock is carried by two 16-in. belt conveyors 600 ft. long to the bunkers. One set of bunkers is for loading cars, auto trucks and wagons. These bunkers have a capacity of about 700 cu. yd. and are built of wood.

Stone Bins Carved in Solid Rock

Four other bunkers are concrete-lined excavations in the rock face of the hill. These bunkers have a capacity of 2800 cu. yd. A tunnel extends longitudinally under them and at right angles to the shore. By means of gates in this tunnel the stone is



Conveyor to bunkers in rock hillside of San Francisco bay



All set for blast—9 tons of powder loaded



After blast—between 65,000 and 75,000 cubic yards displaced

drawn onto two 24-in. belt conveyors mounted on a timber trestle which extends 800 ft. out to deep water in the Bay. These conveyors carry crushed stone at the rate of three yards each per minute. At the outer end of the conveyors the latter rise on a grade which brings them to a height of about 20 ft. above the water, where the rock goes into chutes and then into barges.

The full capacity of this plant is from 650 to 700 cu. yd. per day of eight hours. The arrangement of the conveyors leading from the crushing plant to the bunkers makes it possible to deliver the rock to the bunkers as rapidly as it is crushed, although the bins in the crushing plant provide sufficient storage to carry over a period of several hours in case the conveyors are out of order. The conveyors delivering from the crushing plant handle the rock at such a rapid rate that a vessel can be loaded very quickly.

A considerable part of the output of the quarry is sold f. o. b. plant on barges and vessels, and the balance is delivered around the Bay of San Francisco by the stone company. A specially designed lighter has been installed to make these deliveries. This lighter has a hull 35 x 135 ft. in plan and 10 ft. deep, giving it a displacement of 400 tons. It carries a row of bunkers elevated above its deck and with their bottoms sloped from both sides to the center line of the row.

The under side of the hopper bottom of the bunkers is 7 ft. above the bottom of the hull, thus providing for the installation of gates arranged 10 ft. apart on the center line of the bunkers. A 24-in. belt conveyor runs the full length of the row of bunkers and is fed with rock through these gates. The conveyor discharges at the forward end of the hull to the boot of a 30-in. bucket elevator mounted on a boom 65 ft. in length. This boom consists of a pair of 12-in. channels latticed together and trussed between its ends. It is hinged at the bottom to a heavy cast-iron disk that is pivoted so it can rotate.

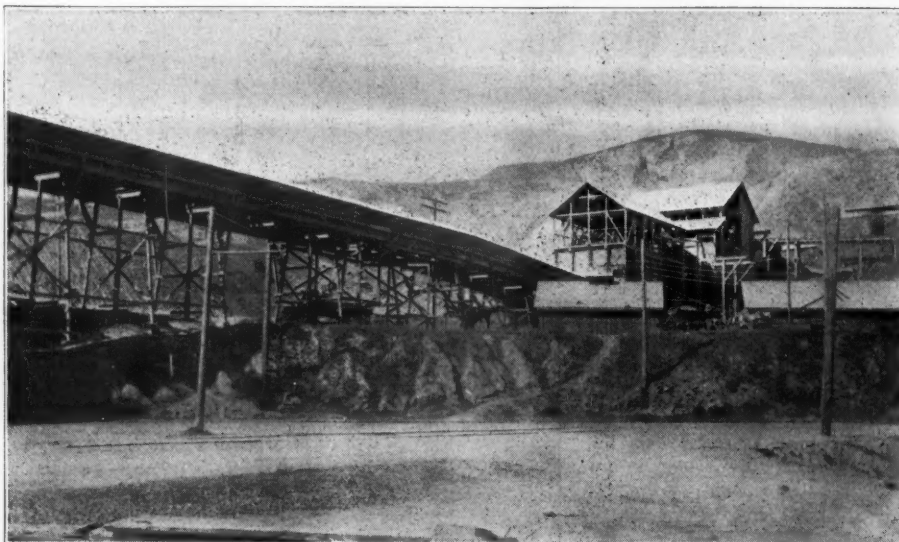
Special Unloading System

This arrangement secures a universal joint so that the outer end of the boom may be placed at almost any angle within a horizontal range of 180 deg. The boom is suspended about 20 ft. from its end by a fall block with a wire rope passing through a four-sheave block, and wound on a crab at the base of an A-frame which carries this sheave. This method of rigging enables the end of the boom to be raised and lowered, and guys on both sides hold the boom in place after it is set. The elevator discharges at the top through a hopper into steel chutes that are built with telescoping sections so that their length can be adjusted to suit conditions.

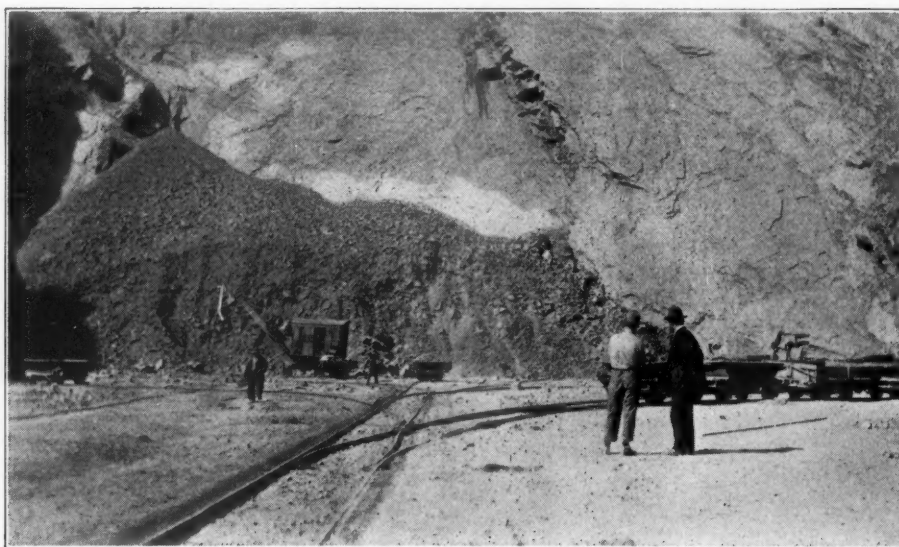
A gasoline engine is installed on the barge to operate the conveyor and bucket elevator. A motor at the top of the boom also may be used to drive the equipment when the lighter is anchored and where

electric current is available. A clutch on the driving arrangement of this motor permits the latter to be thrown out when the

engine is running, and the engine is belted so it can be taken off the system when the motor drive is employed.



Crushing plant from the bay side and conveyor to bunkers



Track layout at working face of quarry



Traction type revolving shovel used for loading quarry cars

Ballast Highways as Well as Railways

Recent Failures of High Class Pavements Make Highway Engineers Recognize Some First Principles

AFTER 20 years experimenting to find a cheap easy way of building a first-class road pavement, highway engineers are returning to first principles and relearning some things their grandfathers learned after they had been building railways for 20 years. Highway engineers haven't yet learned the whole of the old lesson for they don't yet speak of ballasting their pavements. They are merely beginning to concede the importance of drainage.

Probably the opinion of the vanguard of highway engineers is summed up in the following quotations from an article by E. W. James, general inspector Bureau of Public Roads, in the July issue of the Department of Agriculture's official bulletin, "Public Roads." Mr. James writes:

Becoming Matter of Foundations

When the recent failure in several states of a considerable mileage of first-class road is considered, it appears that the problem of the immediate future is going to be the development of adequate foundations to handle a fast-growing motor-truck traffic. The last available figures indicate that there are some 200,000 motor trucks and commercial vehicles now registered in the United States. The great majority of these are in the northeastern block of states, with heavy concentration in other states having improved roads.

Whether the increase in number of trucks in the next decade will in any way approximate the increase in pleasure automobiles during the last one is not a matter of special moment, but it is of the greatest importance whether the gross tonnage of trucks increases rapidly. A single truck of some designs will provide a tonnage equal to five or six touring cars. A single truck operating between fixed termini has damaged a road in a single month to more than the ordinary cost of maintenance for a whole year. A string of trucks operating over a road not properly supported by the existing foundation has entirely destroyed in two weeks a well-built surface costing \$8,000 per mile.

Prolific Cause of Failures

Careful inspection indicates that failures have largely been the result of weak foundations at the time frost is "coming out of the ground," when the water content of the soil is high and foundations are consequently weakened. What degree of weakening is permissible under any conditions before failure is reasonably certain is not known because we never know even approximately the factor of safety in the bearing power of our sub-base or subgrade. The few studies made in this direction have little application to road conditions, because the moisture content of the soil and its grading or texture, which so strongly affect capillarity, have never been adequately considered. Further, it is doubtful if within the immediate future any increase of knowledge of soil conditions will be sufficient to indicate a method of direct control. Capillarity can not be adequately controlled. It must be met.

The same degree of approximation in our road foundation design will doubtless prevail until considerably more data are available regarding soil moisture and its effects. In the meantime such information as we have can be used for what it is worth. Some recent examinations made by an engineer of the Bureau of Public Roads furnish the following interesting data:

Clay below a concrete pavement contained 18.9 per cent by weight or about 46 per cent by volume of water, etc., etc.

Nothing New in This

Is there anything new in these facts? Our less scientific but more practical grandfathers did not make laboratory tests of the amount of water in the mud and clay under their railway ties, but they did get busy and get their tracks out of the mud by using from 18 to 24 in. of BALLAST. They found out by experience that certain materials like gravel and crushed stone afforded good drainage and were therefore good BALLAST. The primary purpose in using ballast was for drainage; and drainage is still the most important function of railway ballast.

Table on Capillarity

How round-about highway engineers are in arriving at this same conclusion is illustrated in the continuation of Mr. James' discourse:

Some extended studies of the action of capillarity have furnished additional interesting data. The following table shows the height to which capillary water rises in certain soils in 24 hours:

Light sandy soil.....	14 in.
Gravelly soil.....	16 in.
Loam.....	16 to 21 in.
Heavy clay loam.....	11 in.
Heavy lava ash.....	16 in.
Pure sand.....	9 in.

What has our engineer learned from these interesting scientific data? Evidently that sand makes a better foundation than clay. Without these data our grandfathers reached a conclusion that sand was a better foundation for track than clay. Only, being less scientific, they were able to reach the conclusion that gravel or crushed stone was considerably better foundation—or ballast—than sand.

More on Capillarity

Mr. James continues his discourse as follows:

An examination of the above figures indicates that capillarity in some cases fills the soil perilously near to the saturation point even when drainage is considered adequate. And the rapidity with which capillary action occurs when there is a source of free water makes it imperative that such source be removed with the greatest promptness and prevented from occurring within a considerable distance, either vertically or horizontally, from soils which are depended upon to support heavy loads. . . .

Experience alone has developed many of the features of our present highway cross-section designs. Certain bearing powers of the soil are more or less unconsciously assumed as we follow accustomed practice. Now that the loads likely to come upon our roads are so much greater, it is a problem of the utmost importance to determine how much heavier our foundations must be, just what loads soils with different moisture contents may be depended upon to bear, and what means if any can be developed to insure no increase of moisture above a safe point. Of course, these problems are closely correlated. How does moisture content affect the bearing power of soils? And ultimately what method of design will be most economical? Will it be cheaper in a given condition to drain excessively or to thicken the foundation? These matters are today a closed book to the highway engineer.

Details Will Become Features

Under the increasing truck traffic, drainage will have to be considered more carefully, moisture content of many soils in many locations considered allowable under past conditions will have to be reduced to save or develop such bearing value as the soil may have, and a great deal of subgrade will have to be reinforced by the addition of suitable sub-base. All of these details, considered heretofore as special features, will become the features ordinarily considered in careful design of high-class, costly pavements. A foundation and wearing course costing \$16,000 per mile are not going to be subjected to what is now known to be an utterly destructive traffic without that due examination of soil conditions and adequate provision for furnishing a proper support in the natural ground that will save the surface and foundation from destruction at a reasonable cost.

Hits Nail on Head at Last

The last paragraph of the above quotation hits the nail on the head: "A great deal of subgrade will have to be reinforced by the addition of suitable sub-base." That is merely another way of saying that if you want a good pavement you have got to put a little ballast under it just the same as our grandfathers did when they began ballasting railway roadbeds to get a track that could be kept in decent condition.

Makes Reports on Rock

THE BUREAU OF PUBLIC ROADS has been assisting the National Research Council in the preparation of a report on deposits of rock, sand, gravel, and other materials for the use of the War Industries Board and other Government agencies. Complete reports of tests made by the bureau on all samples of rock and gravel are forwarded to the council, together with a statement of the location from which the samples were obtained. About 1,000 such tests are being conducted annually.

A Few Uses for Lime in Manufacture of Organic Chemicals

The Function of Lime in the Coal-Tar Dye Industry and Why a Pure High-Calcium Product Is Essential

By C. M. Stine, Ph. D.

Chemical Department, E. I. DuPont de Nemours & Co., Wilmington, Del.

THE MANUFACTURE of very many of the so-called coal-tar intermediates which enter into the preparation of a large and varied line of colors involves the treatment of certain raw materials such as benzol, toluol, naphthalene and the like with various reagents such as sulphuric acid, nitric acid, chlorine, caustic soda, etc., in order that these raw materials may be so altered in character as to lend themselves to the various reactions in which they are to be employed for the manufacture of colors.

While it is true that a number of the processes involved in the manufacture of pharmaceutical products are closely analogous to processes used in the manufacture of dyes, we shall attempt here to outline briefly only one or two type processes for the manufacture of dye intermediates, to serve as an illustration of the nature of this manufacture and the uses to which lime may be put in the manufacture of dyes.

Preparation of Dyestuff Intermediates

There is perhaps no more generally known dyestuff intermediate than that which goes by the name of "H Acid," but there are a number of other dyestuff intermediates analogous in their structure to H Acid, such for example as Freund's Acid, Cleve's Acid, J Acid, Peri and Laurent's Acid, and it is in connection with the preparation of intermediates of this type that lime finds an application. The preparation of intermediates of the type which we have just illustrated by the products named consists in part of combining naphthalene with sulphuric acid and nitric acid and the subsequent treatment of these compounds with a view to replacing sulphuric acid by some other so-called "group."

In order to avoid the use of technical language we can perhaps best illustrate the process by stating that when naphthalene, for example, is treated with sulphuric acid, with a view to causing the naphthalene to combine with varying proportions of sulphuric acid, it is necessary to use an excess of sulphuric acid in order to bring about the reaction. The desired product is, therefore, present in the reaction vessel together with a considerable excess of one or more of the reagents employed.

In case the excess of sulphuric acid is to be removed from this product and in case

the organic product is soluble in water when an excess of lime is added to the contents of the reaction vessel, the insoluble calcium salt of sulphuric acid with which we are all familiar, known as "calcium sulphate," is formed, and may be filtered off from the water-soluble products of the reaction.

It might be well to add that it is usually necessary to dilute the reaction products with water before adding either milk-of-lime or hydrated lime, or some other form of calcium oxide to the reaction mass for the precipitation of the calcium sulphate. It might also be added that in many cases

DR. STINE has kindly consented to supplement the information here given in answer to specific questions which lime producers may address to the editor of ROCK PRODUCTS.

the calcium salt of the desired product is formed and it is really the water solution of this calcium salt which is caught in the filtrate from the filter press, while the press cake of calcium sulphate may be discarded.

A somewhat different process for the preparation of an intermediate may require that a press cake consisting of calcium sulphate and the insoluble calcium salt of the product in question shall be removed from the filtrate which is run to waste, or which may contain other products which are to be worked up in some other way, but the general type of reaction is sufficiently well illustrated by the statement that lime is most frequently used for the neutralization of excess sulphuric acid in the form of calcium sulphate.

It is obvious that where large amounts of sulphuric acid are to be used for a product and where the combination of sulphuric acid is simply thrown away, that the material used to remove the sulphuric acid must be very cheap. At the same time it must be possible to obtain this material under certain specifications.

Lime Must Be Free From Impurities

The reason for stating that it is necessary to obtain this material under certain specifications is that calcium sulphate has certain definite properties which enable the dyestuff manufacturer to so handle his reaction process as to take care of the removal of calcium sulphate from his finished products. If, however, the lime which is employed for the removal of sulphuric acid contains unknown amounts of undetermined impurities such as magnesia, or certain other of the impurities which occur in some grades of limestone, the method of handling the reaction which will suffice for the removal of calcium sulphate from the desired reaction product will not suffice for the removal of certain impurities which may have been present in the limestone and which have appeared in the lime as delivered to the dyestuff manufacturer.

Perhaps this point is best illustrated by calling attention to the quite different solubility which magnesium sulphate and calcium sulphate exhibit in water. It should be added too that the presence of even small quantities of certain compounds such as iron, or magnesia, or lime in the finished dye may result in a prohibitive dulling of shade or in throwing the shade off color to such an extent that the finished product becomes quite unsalable.

Now the finished dye is usually formed from a number of more or less expensive ingredients and it is not only desirable but entirely necessary to assure the purity of each one of the constituents which enter into the finished dye. This assurance as to the purity of the constituents can only be based on an exact knowledge of the composition of the various reagents which are employed in the preparation of each of these constituents.

It should also be borne in mind that impurities present in the lime used may be present in the finished product which the dye manufacturer desires to produce, to even a greater extent than the percentage of the impurities in the lime, because for every hundred pounds of an intermediate product produced there may be 200 or 300, or even as much as 600 or 700 pounds of lime required. If, therefore, there is any tendency for the impurities present in the lime to accumulate in the dyestuff intermediate for the manufacture of which this lime is to be employed, there is addi-

tional reason to specify a pure grade of lime.

Lime Not Always Used to Remove Excess Acid

Lime is by no means always used for the removal of sulphuric acid from reaction products, but it may be used for the removal of CO_2 because the resulting compound calcium carbonate is an insoluble product which may be filtered off, or the lime may be used to bring about certain reactions such as the replacement of chlorine by what the chemist calls "hydroxyl," with a view to effecting a complete transformation in the properties of the chemical when such a replacement is brought about. In this case a soluble salt of lime, namely, a calcium chloride, may be produced and may be separated from the desired organic compound by washing with water if the organic compound is reasonably insoluble in water, or by some other suitable means. Here again the composition of the lime used should be well established in order that the removal of the lime salts may be simplified, since a process which may serve for the removal of lime salts may be not at all adapted to the removal of salts of certain other materials which occur as impurities in the lime used in the reaction and may result in either diminishing the yield or undesirably affecting the purity of the product.

Another Campaign Needed

The question as to the allowable amounts of certain impurities which may be present in the lime used for the manufacture of such intermediates as Freund's Acid, Cleve's Acid, Peri and Laurent's Acid, and the like, cannot be answered for every process of manufacture used in producing these materials, but it seems likely that lime used in manufacturing intermediates of this type should contain less than 2 per cent of magnesium oxide (MgO), less than 1 per cent of material insoluble in hydrochloric acid (HCl), and a total of less than 5 per cent of carbonates. It may be stated in this connection that a great deal of the lime used in the manufacture of this type of intermediates has actually shown by analysis 0.5 per cent or less of magnesia and exceedingly small amounts of unburned limestone; i. e., unconverted calcium carbonate, as well as exceedingly small amounts of material insoluble in HCl such as insoluble silicates and the like.

Sometimes the process of manufacture involves not only the removal of sulphuric acid from the desired product by precipitation with lime but the subsequent removal of the calcium which has been combined with the product when the necessary excess of lime has been added to insure the complete neutralization and precipitation of all the excess acid present.

Lime in Manufacture of Carbohc Acid

The case in point may be illustrated by some of the preliminary steps incidental to the manufacture of phenol or "carbohc

acid" by a well known process. Benzol is treated with an excess of sulphuric acid, forming the so-called sulphuric acid of benzol and leaving an excess of sulphuric acid present in the vessel in which this reaction has been brought about. An excess of lime is then added to precipitate the sulphuric acid and to obtain the benzene sulphonic acid in the form of its water soluble calcium salt. This water soluble calcium salt is filtered off from the major portion of the precipitated calcium sulphate and is subsequently treated with sodium carbonate in order to precipitate the calcium which has been combined with the benzol mono-sulphonic acid, thus obtaining the sodium salt of benzol mono-sulphonic acid.

Preparation for the Re-Action

This water soluble sodium salt of benzene mono-sulphonic acid is then again filtered from the precipitated calcium carbonate and is subsequently evaporated to dryness in order that it may be obtained in

suitable form for the next step of the reaction. Any material which has not been precipitated with sodium carbonate and remains dissolved in the solution along with the sodium salt of benzene mono-sulphonate, will, of course, appear in the evaporated product.

Regarding Other Processes

There are certain processes analogous to that which has just been described in which the appearance of any considerable amounts of such impurities in the solutions of the organic products desired would interfere with subsequent steps in the manufacture.

While this article does not by any means pretend to cover the various applications of lime in the manufacture of organic chemicals, it will serve to indicate the nature of some of the processes in which lime is used and the reason why a fairly pure grade of lime must be furnished to the manufacturer engaged in this line of work.

Fall Liming of Proved Benefit

Farmers Should Be Urged to Use Lime on Plowed Lands Now

By John H. Voorhees

New York State College of Agriculture,
Cornell University

A YEAR AGO the lime manufacturers waged a campaign to increase the use of lime by farmers in winter. This campaign was conducted by the Agricultural Lime Bureau. A pamphlet published by them gave a resumé of the opinions of many of the leading agriculturists throughout the Eastern part of the United States. These men not only approved the campaign but endorsed it as an economic factor for greater production of foodstuffs and offered their hearty co-operation and assisted materially in making it a success.

A year has passed and the results of a year ago—last winter—are evident in nearly all agricultural sections East of the Mississippi River. Greater yields and greater profits have resulted almost universally. Considerable lime was applied on growing stands of wheat and invariably the results were visible long before the threshing made the exact results visible by measure.

Another Campaign Needed

Such a campaign is just as important again this winter and no time should be lost in inaugurating it because the time for placement of orders by the farmer is rapidly approaching. He is now completing his fall work. Grain has been planted, silos filled, and corn partly husked, and he should have his lime on hand before snow drifts fill the roads and cover the fields.

There are a number of precautions to be taken. Farmers should be careful in the selection of fields for application. The wash on hillsides would undoubtedly make the

practice an undesirable and unprofitable one except where they are well covered with stubble of a grass crop or a growing crop. Poorly drained fields where water lies during winter or early spring would probably benefit less because the injury of tracking by team and wagon would be great and the lime would be likely to run together, crust and puddle. On the other hand level or slightly rolling fields, especially those covered by some growing crop will be greatly benefited and farmers should be urged to use their spare time to lime them.

For Fall Plowed Ground

In my opinion fall plowed ground may be limed with the usual accruing advantages but land intended for spring plowing should not be limed because lime is soluble and naturally works down into the lower layers of soil though it is believed that the downward movement is not as rapid as formerly supposed.

It is my opinion that these facts should be laid before farmers, and that a campaign to increase the use of lime by farmers this winter would be a real benefit to the country as one means of increasing the food supply necessary to maintain stability in the markets of the United States and abroad.

William B. Hill Dead

WILLIAM B. HILL, chairman of the Executive Committee and organizer of the Ash Grove Lime & Portland Cement Co., died at Los Angeles a few days ago. Mr. Hill was a pioneer in the lime business in the Kansas district and one of the best known lime men in the country.

Safety Hazards of the Cement Industry

Where the Hazards Are and How to Minimize Them

IN DEALING with hazards connected with the cement industry there is much to be said about the education of the employee.

For instance, let us first mention the raw material unloading track hazards, where there is no possibility of the men being properly protected when unloading material (the danger of frozen materials in the winter increases this hazard), the switching of cars, the care of tools, the construction of walks and passageways and the misunderstanding of operating signals.

Men working in the raw material building, at the opening in the bin are very often subjected to many hazards, that of large lumps of frozen material rolling out of the bins, perhaps bruising their feet and legs. Then also it is at times necessary for workmen to enter these bins, the danger here is of undermining material, also material on track and structure above which may fall at any time, and should not be overlooked.

We next come to crushers and dryers, as well as elevators and conveyors of all kinds. Here we find hazards so numerous it would be impossible to mention them all, for here we usually find gear drives, chain drives, belt drives and others, as well as revolving drums and rolls, and motors to drive them, all of which offer opportunity for accidents.

Next we have preliminary mills of all types and raw material finishing grinders which have their different styles of feeders, and are far from safe.

In the kiln room we have the slow run-

By O. C. Soederquist,
Supt., Bluffington Plant, Universal Portland Cement Co., Bluffington, Ind.

ning kiln, which in itself is probably harmless, but the machinery necessary to drive it, consisting of gears, belts, pulleys, and motors, as well as line shafting in many cases. These are necessarily placed in locations which tend to make them dangerous,

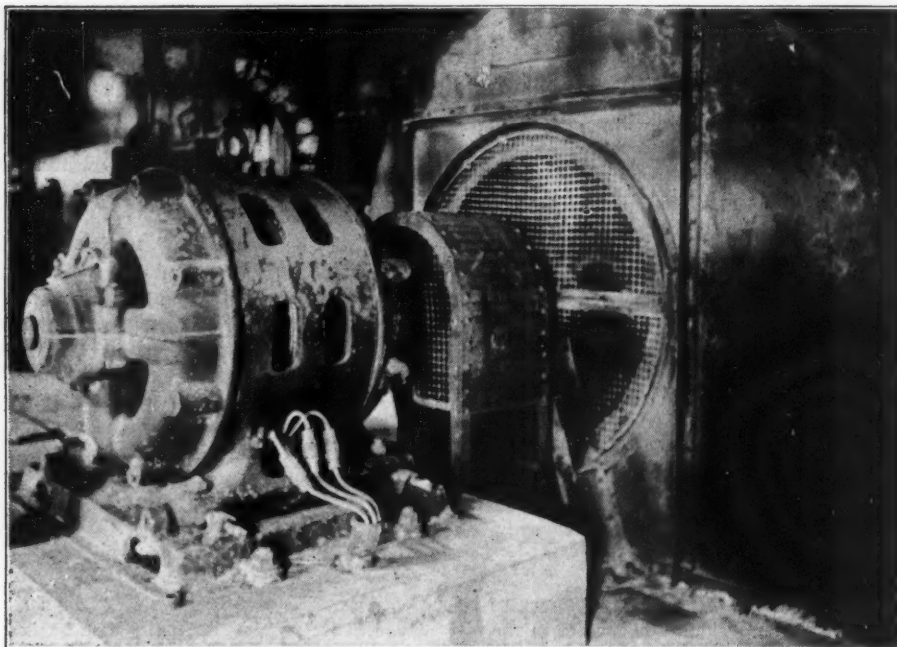
particularly for oilers; other places, such as coolers, pan conveyors, elevators, etc.

Coal feeders of all types should be looked into with the idea in mind that when the kiln is down for a short period the danger of accidentally starting this feeder may cause an explosion with enough force to blind or burn men who may pass in front of kiln.

In the coal house we have the usual hazards connected with drives of all kinds,



Properly guarded overhead passages and bridges



Fan and motor coupling guards; electric wire conduit and disconnectors

as well as dryers, crushers and pulverizing mills of all types, but of course the great danger here is the possibility of an explosion, also the coal dryer discharge should be carefully watched, as it may clog, causing the dryer to fill and naturally heat very rapidly, causing serious damage.

Our next stop is at the clinker pile, which as a rule has nothing but a few conveyors or cranes which handle the clinker. As to conveyors, we all know that they are dangerous; as to cranes, there are only a few things, such as fire hazards with electrical apparatus, carrying of loads over workmen, approaches for crane men to enter and leave crane, danger where truck or truck wheels pass near walk or steps where it would be possible for men to reach or lean over runway.

In the finishing mill, as a rule, we find about the same machinery that we have in the grinding end of the raw mill.

Machinery is not our only hazard in the mill, as the danger of material of all kinds left on walks, platforms, hoppers and

scaffolds may fall and cause many accidents.

The stock house and packing rooms have their dangerous places, such as drives for tunnel screws which usually are placed in a low basement; here as well as many other places throughout the mill the oiler should be considered, for he is placed in a dangerous position where he must be careful.

In the packing rooms there are the usual screws, belts, elevators and other driving machinery, as well as packing machines which are dangerous.

At the stock house it might be well to mention the railroad, for here we have the loading platform, which must necessarily be as close to cars as possible, causing a hazard which must not be overlooked. The

but also in the health and happiness of his family and the community.

Belt Hazards

The hazards connected with the operation of belts are those of getting caught between belts and pulleys, or having hand cut or burned by moving belts, grasping a moving belt to stop a machine, or shift a belt, putting belt on driving pulleys while in motion. Where there is a possibility of workmen passing through moving belts, attempting to step over them, or working in close proximity to them, a great hazard is created.

Hand Tools

The hazards connected with the use of hand tools apply to both the user and

others who work within the range of flying objects from such tools, such as hammers, and chisels with mushroom heads, or hammers flying from handles.

Goggles

It is estimated that 200,000 eye injuries occur annually in the United States. Not all of these are industrial accidents, but there are approximately 15,000 persons who were blinded in industries. The money lost to the employer and employee is unknown, but the suffering and privation of the injured persons is enormous, and is of greater importance. It has been demonstrated in recent years that most industrial eye accidents can be prevented by wearing proper protection over the eyes.

Platforms and Scaffolds

Platforms and scaffolds when improperly constructed and built of defective materials, are a great source of danger.

Ofttimes men who are put on erection of such work are careless, and do not give this matter sufficient thought to make conditions safe.

Coupling and Collars, Keys and Set Screws

These present many hazards, of which the following may be included:

Shaft couplings, and set collars, clamp couplings, jaw clutch couplings, universal and flexible couplings, friction clutch couplings where exposed, key seats in end of shaft where exposed to contact, set screws on revolving parts where exposed to contact.

Pulleys

Pulley hazards are apt to be very dangerous in cases where the belt slips off the pulley and becomes wedged between the hanger and the pulley, or between two pulleys, thus pulling down line shafting. Con-



Tube mill with gears completely enclosed

railroad is a source of hazards all over the mill, particularly where cars pass doors to buildings, as well as at the end of buildings where men are apt to step out on track in front of trains.

Slipping Hazard Everywhere

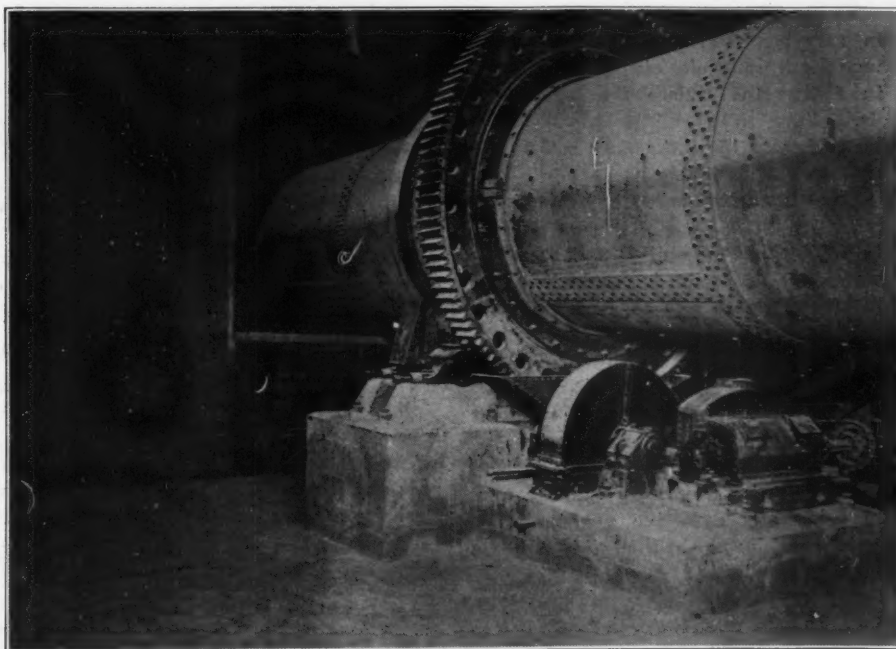
The slipping, tripping and falling hazard is present not only in the mill, but in the yard, shop, and even in the office unless rubbish of all kinds, as well as machinery, tools, lumber, etc., have their proper place of storage.

The wearing of torn clothing, flowing neckties, loose sleeves, as well as gloves, are all hazards.

We believe that a hazard that should also be taken into consideration is that of the health of the employees.

In order that the men can go about in a contented manner, the physical surroundings must not only be safe, but must also be healthful.

Plant sanitary equipment is a part of these physical surroundings, and plays an important part, not only in the happiness,



Kiln drier with guarded gear drives

struction of guards is an important safety factor, and if not properly constructed, present many hazards.

Boilers

There are many hazards connected with the operation of boilers, and I will not try to name them all: the inspection of boilers, the operation, the water gauge glass, the safety valve, the blow-off pipe, the collection of scale and sediment in the boilers, and many other things too numerous to mention.

Grinding Wheel Hazards

The operation of machinery at high speed always increases the accident hazard, unless the utmost precaution is exercised, and the grinding wheel, whose cutting surface generally has a velocity greater than a mile a minute is no exception.

Chains, Cables and Slings

Chains, cables and slings are the mediums by which loads of material are suspended and transported through shops and mills, and offer many hazards which can be eliminated only by the proper care of same.

Signs

In plants where electricity is used the hazards are greater because so many men do not know the danger that lies in the electric wire.

Electrical hazards are of great importance, and danger is usually found:

In failing to ground all conduit pipes.

In leaving conduit pipes open so water can enter.

In using pieces of wire as a fuse.

In putting a fuse where water will reach it.

In inclosing a motor or generator to shut off the air.

In failing to pull the switch before replacing fuses.

In carrying steel tools when working around dangerous electrical machinery.

In failing to insulate the handles of tools.

In failing to blow the dust out of the generators and motors.

In failing to clean wires before splicing them.

In failing to tape splices and all other places where insulation is required.

In screwing lamps in sockets while the current is on.

In lighting cigarettes by means of switches.

In looking at an electric arc without wearing blue goggles.

In failing to replace all safety devices.

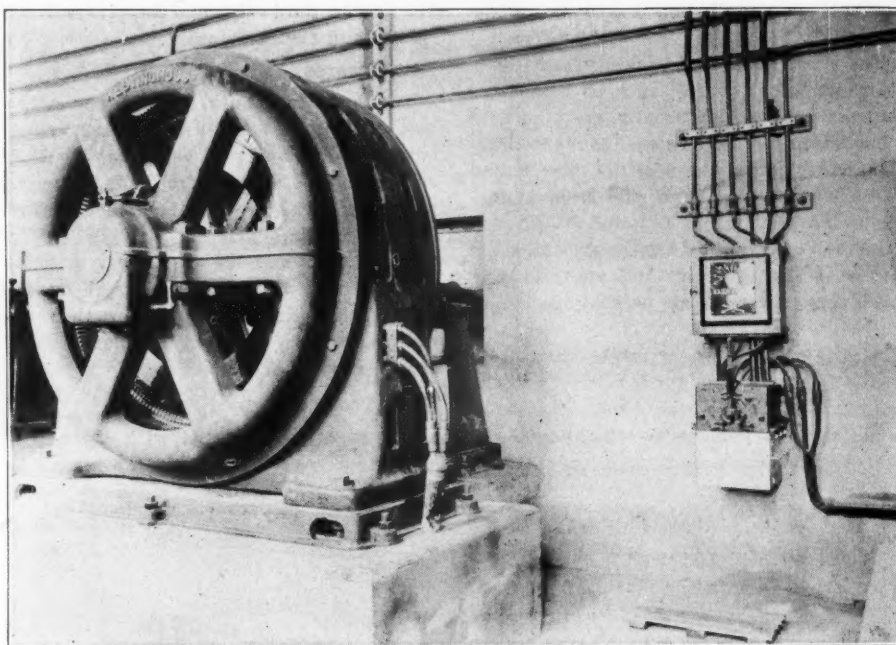
In taking any unnecessary chances.

In using any defective machinery, or allowing machines to be used which are not properly grounded.

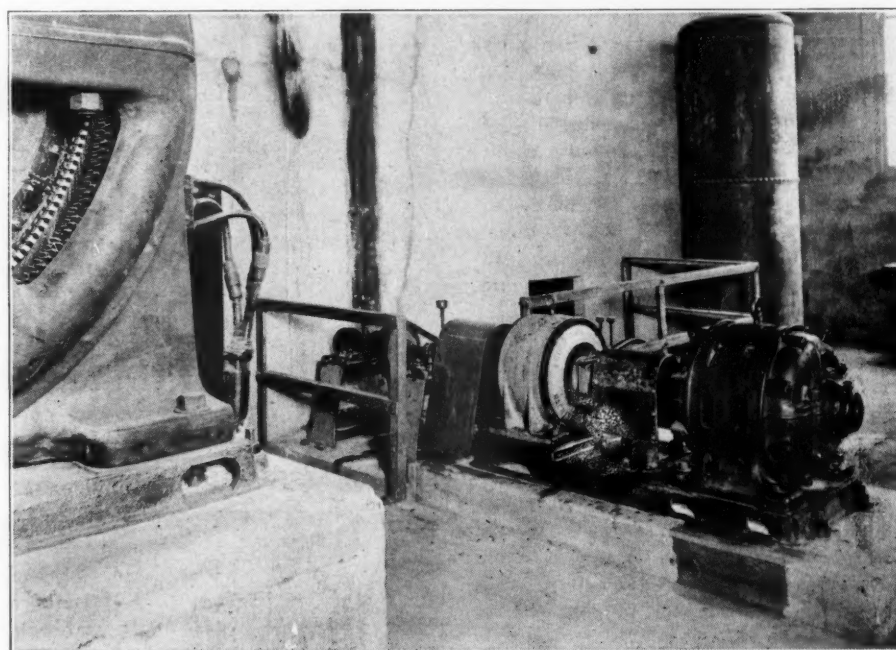
In failing to report dangerous places.

In failing to read the rule book and to obey the rules.

In failing to test work before leaving it.



Motor drive with wooden disconnectors; switches with warning sign



Motor for conveyor, showing coupling, shaft and belt guards; grease cups on pipe extensions; electric conduits and connectors for heavy motor

In working on live circuits unless necessary.

In closing a switch without full knowledge concerning that circuit, and why the switch was open.

In failing to wear the safety belt when working on poles.

The best remedy for all electrical hazards and which should be brought out very strongly for the benefit of the workman rather than the electrician, is to let electrical apparatus and wires alone.

Infection Hazard

The infection hazard in the cement industry, we believe is less than any other,

but nevertheless great precautions must be taken.

Ladders

In ascending or descending from one level to another, ladders have been an important factor. The ladder in its various forms, has been called one of civilization's most dangerous devices, and statistics show that a great number of accidents have happened thereby.

This is not strange, however, when we consider that there are probably more ladders used by man than any other single device involving hazards. Scarcely a structure is built where the peculiar value of the ladder is not employed, and after

the structure is finished the ladder is retained in the home, on the farm, in the factory, in the office building, everywhere. The hazard has been increased, because the ladder is an emergency article.

Removing the trouble from the minds of man, where the trouble has been all of the time, and following the simple rules of construction and safe practices, ladders will be as safe as we are willing that they should be.

Welding

Some of the hazards connected with the oxy-acetylene welding may be found in the following:

Testing reducing valves or gauges.

Coupling reducing valves.
Having generators near fires or lights.
Failure to wear goggles when engaged in welding and cutting.
Wearing improper goggles.
Failure to properly repair defective parts after notice.
The use of matches.
Careless handling of oxygen and acetylene cylinders.
Using an acetylene cylinder when it is lying flat in a horizontal position.
Failure to shut off gases over night.
Using a hammer to open an oxygen cylinder valve.
Failure to open cylinder valve slowly.
Failure to wear respirators.

Failure to provide a fire extinguisher, or a bucket of water for every welding unit.

These are a few of the many hazards, and in ending I will say, the practice of safety principles does not cause a workman to be slow, timid or over-cautious. It demands no sacrifice of time, or progress, and no impairment of efficiency. It insists on the adoption of the safe course in preference to the unsafe. It emphasizes the importance of seeming trifles where preservation of life and limb is concerned. It tends to develop in the workman an instinct that scents danger, weighs possibility and consequences and awakens in him an actuating consciousness of the necessity for using care at all times.

Glauconite Yields Potash, Says Canadian

TORONTO, CAN.—Dr. R. F. Ruttan stated at a meeting of the Advisory Council for Scientific and Industrial Research that glauconite gives a big yield of potash. In New Jersey a company is using the green sands with good results. A report from British Columbia is that a bed of glauconite has been found there. If true, this will be used to obtain potash.

One firm in Canada has introduced a few condensation pipes in the cement plant to condense potash salt vapors. Analysis of the materials used in this plant justifies the expenditure to install a Cottrell system.

Some potash is being obtained from the old process of leaching the ashes of hardwoods and the collection of ashes has been revived in some places.

Investigations are being carried on at Queen's University, Kingston, regarding the use of nepheline cyanide. This rock contains four or five per cent of potash. Progress is now being made in producing a fertilizer from this rock. Every encouragement is being given those who are investigating processes for obtaining potash from feldspar.

One of the big problems in Canada is to obtain fertilizer, and fish refuse from fisheries looks like a profitable source of supply. It would be a conservative estimate to say that there are upwards of 300,000 tons of fish waste in Canada. Besides the fertilizer from this source poultry feed may be obtained.

By-Product Potash from Feldspar Cement

H. E. BROWN, a chemical engineer of New York City, has developed a process for making a special cement from the slag obtained from a blast furnace and at the same time recovering water soluble potash from the gases. He charges limestone, coke and feldspar into the furnace. Now if iron ores of suitable kind could be used for a portion of the raw material, it might be possible to produce potash from

the gases, also pig iron, and a slag which could be readily converted into a marketable cement. As the market varies with the supply and price, the furnace charge could be varied so as to increase the potash and reduce the iron or vice-versa. The process has been developed to the extent that both potash and the special cement can be produced, but investigations looking to a reduction in the operating cost have not been completed. It appears, however, that with an assured market for the cement at fair prices, the process can be operated successfully and show a good return on the investment, especially when the price for potash is high. In this connection, it seems that consideration might well be given to the use of powdered coal introduced through the tuyeres and thus reduce the coke required and possibly doing away with it all together. It would materially reduce operating costs and increase production and recoveries.

Phosphatic Fertilizer From Slag

AMERICA'S largest manufacturing industry is iron and steel. The pig iron recovered in smelting iron ore amounts to about 25 per cent of the raw materials. The equivalent of about 14 per cent is driven off by volatilization in the cooking of the coal; in the process of smelting a further 40 per cent escapes in gas, fume and dust; and the remaining 21 per cent represents the slag.

The economic uses of blast-furnace slag have been greatly developed the last few years. Formerly this was an incumbrance and its disposal was often a matter of considerable expense. Of much more value as fertilizer is the slag obtained in the preparation of steel from high phosphorus pig iron. To remove the excess of phosphorus the iron is melted in converters lined with limestone, and quicklime is added. At a certain stage air is driven through the molten material, which leads to an accumulation in the slag of the phosphorus originally present in the metal. This slag is drawn off and cooled, and when finely

ground is placed on the market under the trade name of basic slag. The phosphoric acid in the slag prepared in this way varies from 11 to 23 per cent.

For a long time the fertilizing value of the slag was not recognized, but it has now become one of the most popular of commercial fertilizers. In fact, on account of its freedom from acidity many prefer it to any other phosphatic material. The slag produced for the fertilizer trade amounts to about 2,000,000 tons annually.

Rock Fertilizer Patent Granted to Italian Company

A PATENT for a process of making phosphate-potash fertilizer has recently been granted to Alberto Francesco Delacourt, Genoa, Italy, assignor to Società Anonima Italiana Gio., Ansaldo & C., Genoa, Italy.

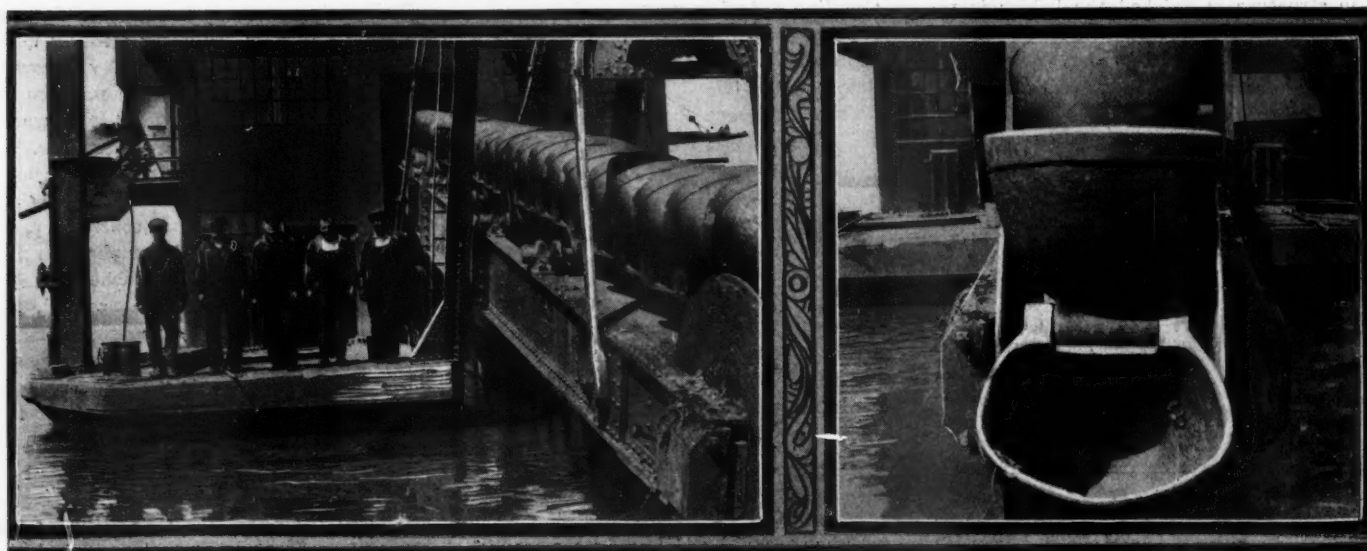
The process is described as producing a phosphatic potassic fertilizer which comprises heating only to a temperature capable of softening the mass, a mixture of materials containing tri-calcium phosphate, a potassium-containing silicate rock, and free silica.

A process of making a fertilizer containing available phosphoric acid and potassium compounds, which comprises heating only to about 1000 to 1100° C., a mixture of materials containing tri-calcium phosphate, a potassium-containing silicate rock, and free silica.

No Potash in Canada

REPORTS of potash deposits in Canada appear to be greatly exaggerated. A local report says: The potash which it was claimed had been found in the Northwest does not seem to be of much commercial importance. It is very doubtful that the amount of potash will pay for extraction, though it is possible that other beds may be found which will give higher results.

Steady purchases of War Savings Stamps are still necessary to finance the government for its war expenditures.



Crew of the "Elco" in Niagara River, at left; at right, manganese steel buckets, weighing 720 lbs. each

Floating Steel Sand-and-Gravel Plant

Dredge "Elco" of the Empire Limestone Co., Buffalo, N. Y., Most Modern Plant of Its Kind

BUFFALO, N. Y., like Pittsburgh, Cincinnati, Louisville, and other river cities is the center of a big sand and gravel dredging industry. Generally each such locality has its own type of dredge, developed to meet local conditions and requirements. In these developments Buffalo has been far behind owing to the fact that local architects and engineers still accept the material as it comes from the river without grading or sizing. Also incidentally Buffalo is one of the few cities left where sand and gravel are still sold by the cubic yard instead of by the ton.

One sand and gravel producer, however, has foreseen the time when graded sand and gravel will be the rule and has accordingly provided himself with an up-to-date plant for producing them. This is D. Hyman of D. Hyman & Co., and the Empire Limestone Co. This company's dredge "Elco" is just completing its first season's work. The "Elco" is a development of the Pittsburgh district type of Ohio River ladder dredge and is the first one of its kind to operate in Niagara River.

All-Steel Hull and Deck House

The hull of the "Elco" is steel, 140 ft. long by 35 ft. beam. The ladder is 58 ft. long and the dredge will dig to a depth of about 50 ft. The buckets are of 4 cu. ft. capacity each, close connected (24 in. c. to c.) and are made of manganese steel, weighing 720 lbs. each. The rated capacity of the dredge is 2,600 tons of finished material per day of 10 hours. The speed of the bucket chain is from 50 to 60 ft. per minute.

The deck house and all the superstructure

is of steel frame with corrugated iron sheathing. Storage space and an office are provided, but not living quarters for the crew as in dredges used on the Ohio River. Even the spuds are all steel, each being operated by a separate hoisting engine. The whole plant is operated by a crew of five men.

Power Plant Details

Steam is furnished by two 65-h. p. 62 by 140-in. vertical boilers. Each has a total heating surface of 804 sq. ft. and makes steam at a maximum pressure of 135 lbs. per square inch. Between the boilers, as shown in one of the accompanying views, is a cylindrical coal bin of 32 tons capacity, which is filled from the roof of the deck house by a crane and clamshell bucket.

The main engine is a 16 by 20-in. Ball side-crank type "I"—a simple reversing engine taking steam at 110 lbs. with a throttling governor. This engine is located on the left-hand side of the gravel screen on the main deck as shown in the accompanying plan and illustration. This engine drives the bucket chain, screen and elevators.

For raising and lowering the digging ladder a 8½ by 10-in. double-cylinder, reversing, single-drum, swinging hoist engine is provided. This engine is also mounted on the main deck in front of the main engine at the left of the ladder, or on the port side of the dredge.

The stern spuds are raised and lowered by two 8 by 8-in. double-cylinder reversing hoist engines, and the forward spuds by two 6 by 6-in. engines of the same type.

An unusual feature are the two three-drum winches, one on each side, near the stern of the dredge for handling barges alongside.

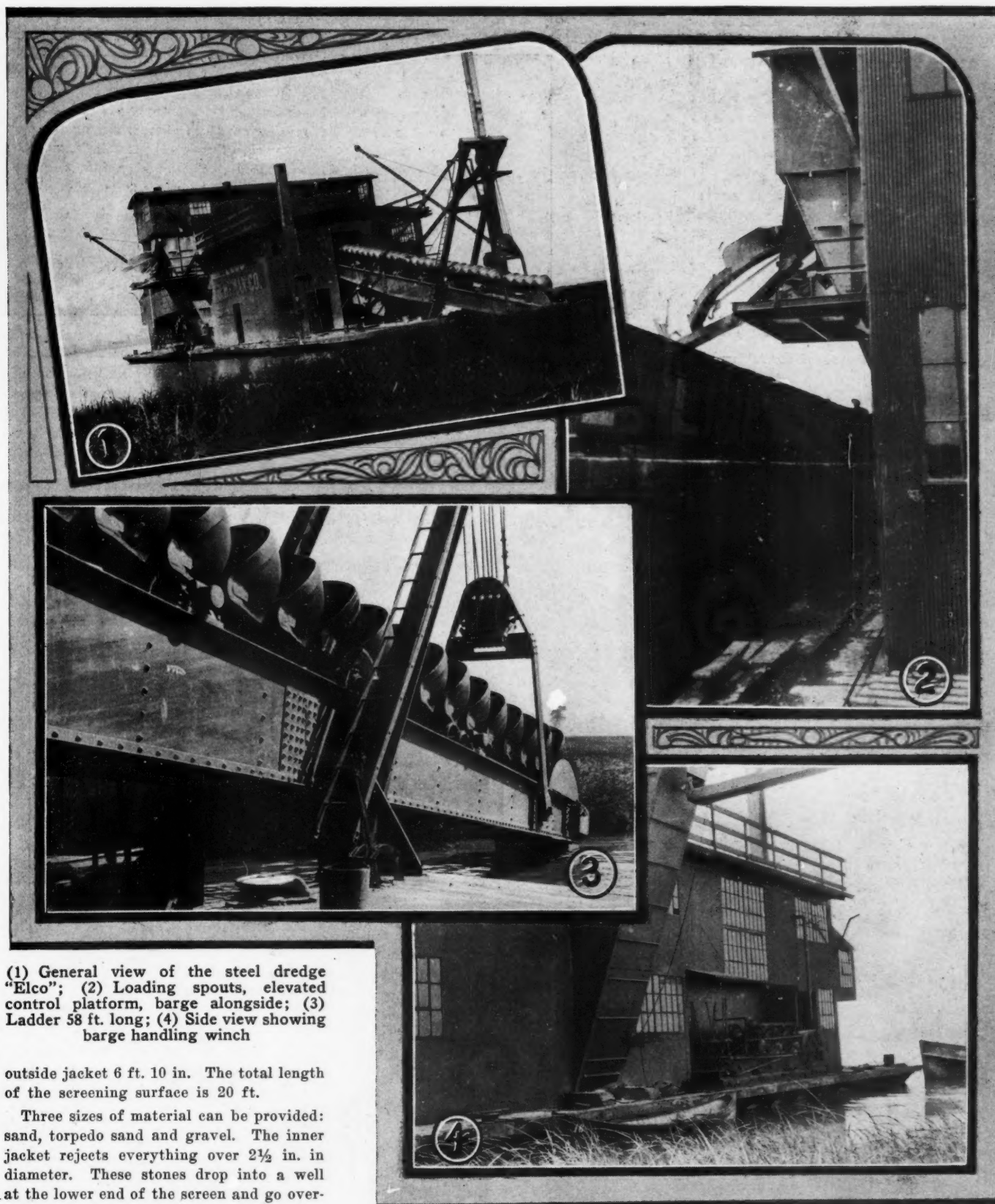
Each of these engines will develop a single line rope pull of 17,000 lbs. at a speed of 54 ft. per minute. All gears are steel castings with cut teeth. The drums are 16 in. in diameter. These winches are located alongside the cabin in a position such that ropes can lead both forward and aft and around the chocks at the end. By skillful use of the three drums almost any kind of a maneuver may be executed with the barges.

Lighting and power for machine shop motors, etc., are provided by a 10-h. p. turbo-generator unit alongside the main engine. All belts, gears, chain drives, etc., are protected by sheet-metal guards in the most approved manner. The color scheme inside and out is yellow, which gives the entire plant a very attractive appearance.

Power-plant auxiliaries include one 5½ by 3½ by 6-in. steam pump for supplying the hot-water heater, one 200 h. p. feed-water heater, one 8 by 6 by 12-in. light piston pump for pumping bilges and one 7 by 4 by 8-in. outside center-packed pump for boiler feed.

Sand and Gravel Plant

The sand and gravel fall into a steel hopper and chute where water is supplied from an 8-in. horizontal centrifugal pump of 1,200 gal. per minute capacity at 800 r. p. m. The chute discharges into an inclined revolving screen 25 ft. 8 in. long. This screen is double-jacketed, the diameter of the inside jacket being 4 ft. 7 in. and of the



(1) General view of the steel dredge "Elco"; (2) Loading spouts, elevated control platform, barge alongside; (3) Ladder 58 ft. long; (4) Side view showing barge handling winch

outside jacket 6 ft. 10 in. The total length of the screening surface is 20 ft.

Three sizes of material can be provided: sand, torpedo sand and gravel. The inner jacket rejects everything over 2½ in. in diameter. These stones drop into a well at the lower end of the screen and go overboard, but it is intended to install a crusher and recover this material as soon as market conditions justify.

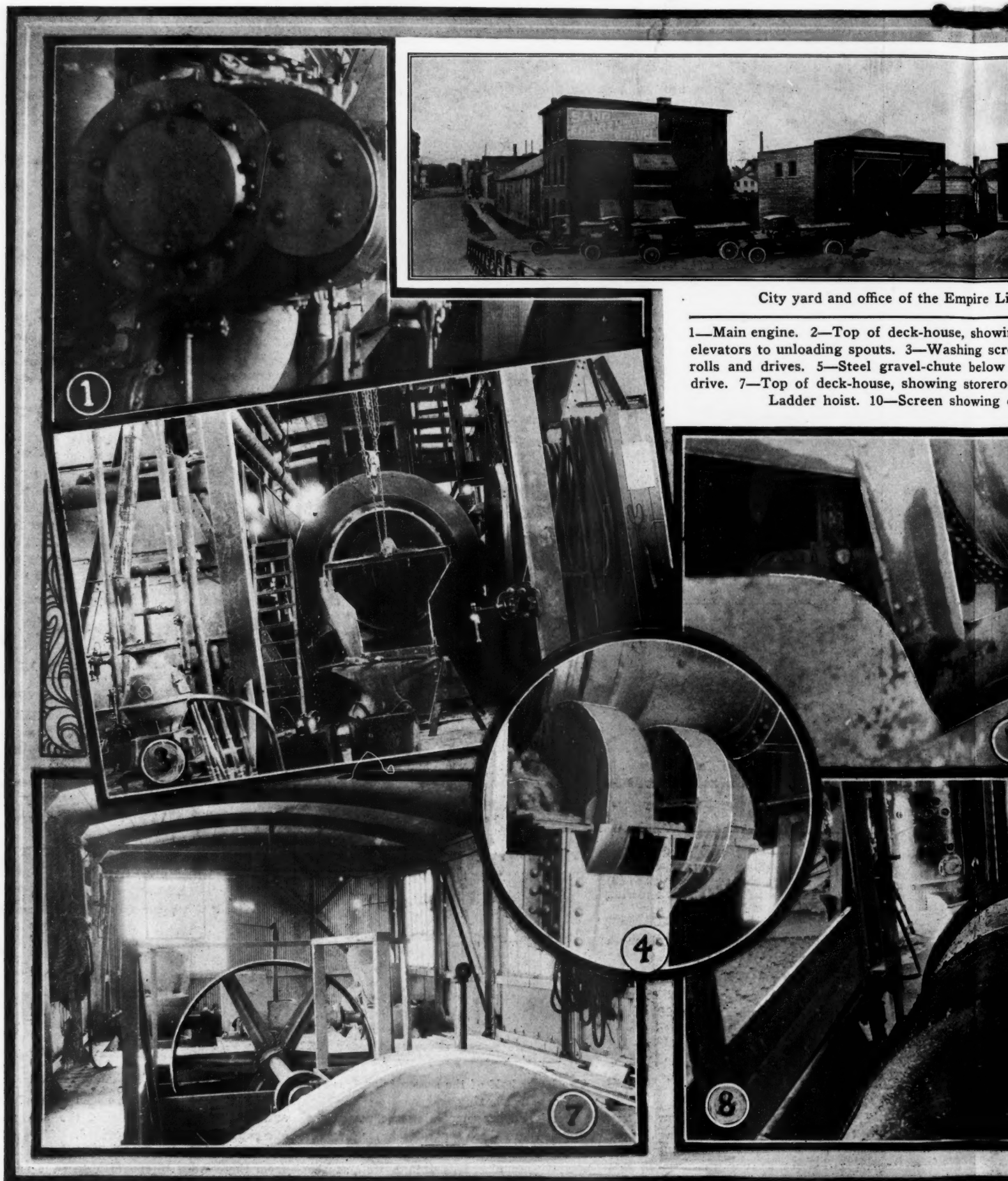
The screen is supported on four rollers, the two at the upper end being driven through enclosed bevel gears. The screen revolves at 11 r. p. m. and is inclined on a 1 to 12 slope. Wash water is supplied by pipes both inside and outside the screen.

The lower half of the screen is enclosed in a sheet-steel boxing.

Sand and gravel passing the screen are dropped into three separate chutes, according to the size of the material. All three chutes may discharge into a well at the right-hand side of the dredge or one may discharge to a well on the opposite side.

On the right-hand side the two chutes discharge to a well with two compartments, and on the left-hand side of the dredge one chute and well are provided.

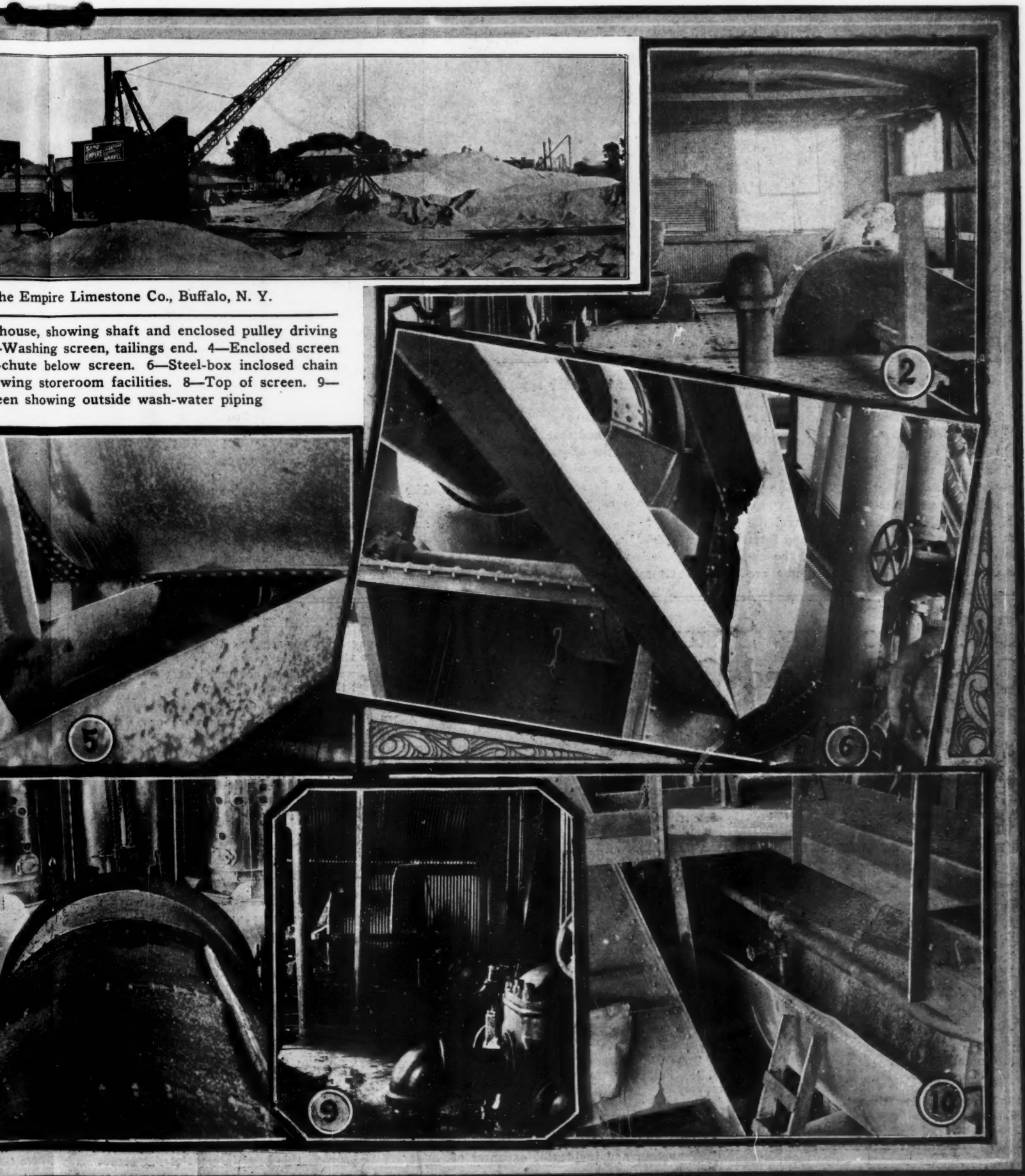
Three bucket elevators take the material from these wells to spouts where the material flows by gravity into barges alongside. Clean water is added to the material



City yard and office of the Empire L...

1—Main engine. 2—Top of deck-house, showing elevators to unloading spouts. 3—Washing screen rolls and drives. 5—Steel gravel-chute below drive. 7—Top of deck-house, showing storeroom. Ladder hoist. 10—Screen showing

Interior views of the up-to-date sand and gravel dredge "Elco"—a floating, screen...



the Empire Limestone Co., Buffalo, N. Y.

house, showing shaft and enclosed pulley driving
Washing screen, tailings end. 4—Enclosed screen
chute below screen. 6—Steel-box inclosed chain
wing storeroom facilities. 8—Top of screen. 9—
screen showing outside wash-water piping

coating, screening and washing plant of the Empire Limestone Co., Buffalo, N. Y.



Looking over screen; coal bin in center, boilers on either side

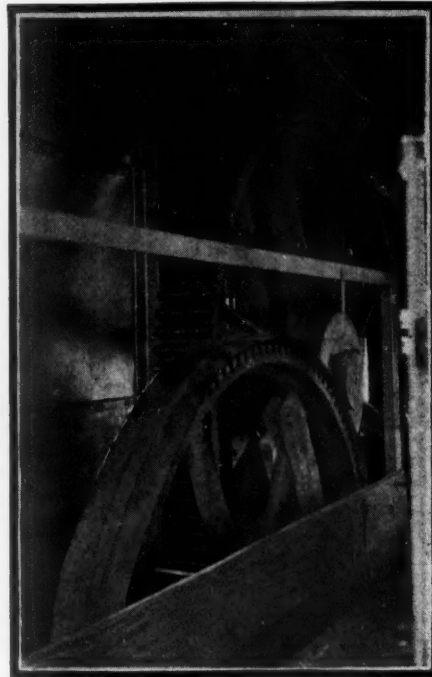
as it is dumped from the elevators into discharge spouts, so that a final washing is given

There are two loading spouts on the right-hand side of the dredge and one on the left-hand side. As the material is now sold as a mixture of sand and gravel the two right-hand spouts are joined and form one discharge as shown in one of the accompanying illustrations. The spouts are

controlled from an elevated platform by a power-driven hoist and crane.

In addition to the original 8-in. centrifugal pump for the wash water two auxiliary pumps have been added, one of 275 gal. per minute capacity and one of 175 gal. capacity.

The "Elco" was designed and built by the engineering works department of the Dravo Contracting Co., Pittsburgh, Pa.



Gears driving bucket chain

The general superintendent of dredging for the Empire Limestone Co. is T. B. Watkins and Ed. Henrette is captain of the "Elco."

The "Elco" during the present season has been eating up the last sand and gravel island in the Niagara River.

Cost Accounting System Adopted by Chicago Sand and Gravel Association

THE CHICAGO ASSOCIATION of Sand and Gravel Producers have adopted a cost accounting system proposed by a committee appointed for the purpose. This committee was composed of B. H. Atwood, E. J. Roche and F. E. Lane.

The report as submitted is as follows:

PROPOSED COST ACCOUNTING SYSTEM

The factors entering into cost shall be grouped under three general headings.

1. General expense.
2. Selling expense.
3. Production expense.

Distribution of expenses to the three main expense accounts.

GENERAL EXPENSE:

1. Salaries of officers and office employees.
2. Office expenses.
3. General expense.
4. Bad accounts.
5. Taxes.
6. Interest on investment.
7. Depreciation.

SELLING EXPENSE:

1. Salaries of salesmen.
2. Expenses of salesmen.
3. Advertising.

PRODUCTION EXPENSE:

1. Salaries and wages.
2. Power and fuel.
3. Expense.
4. Repairs.
5. Depletion or royalty.
6. Insurance.
7. Stripping.

THE ABOVE ACCOUNTS SHALL INCLUDE THE FOLLOWING ITEMS

GENERAL EXPENSE:

1. Salaries.
2. Stationery, printing, telephone, postage, and office supplies.
3. Legal expense, membership in associations, subscription to papers.
4. All uncollectable accounts charged off during the current year.
5. Income and war taxes.
6. Invested capital at 6 per cent.
7. Depreciation of office fixtures, automobiles, buildings, machinery and personal property.

SELLING EXPENSE:

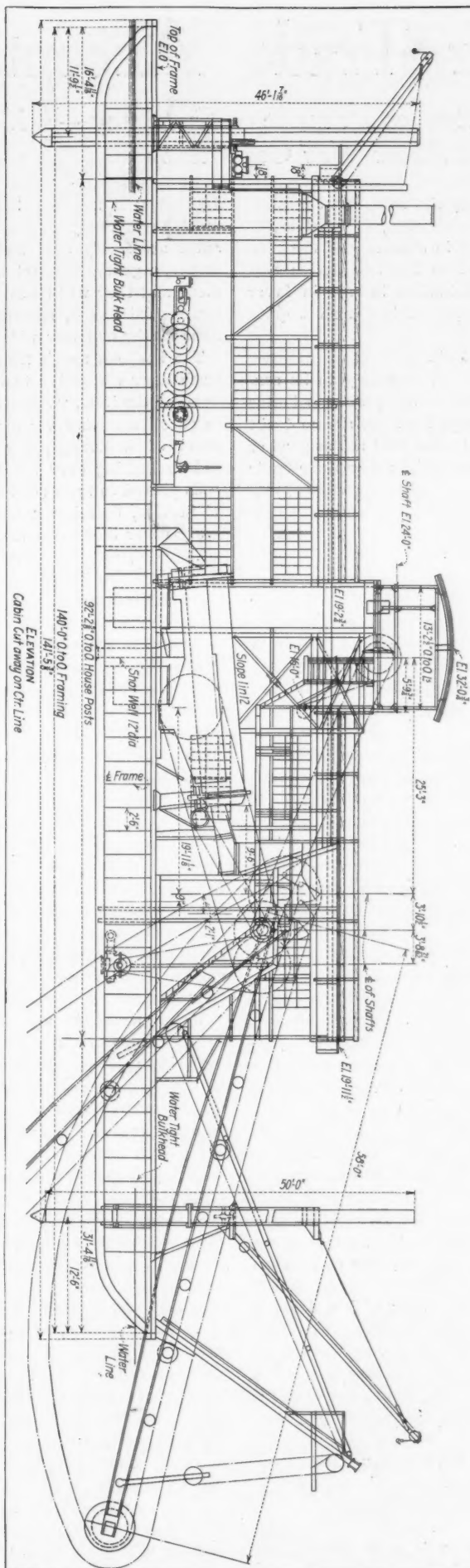
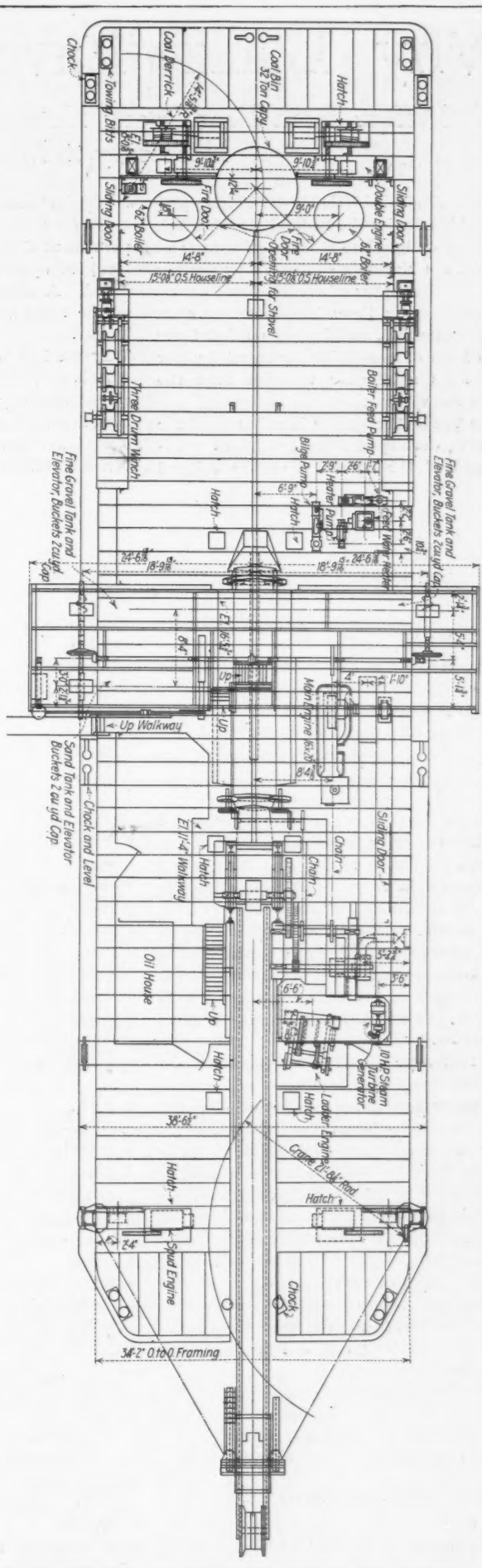
1. All salaries paid to salesmen.
2. Traveling and incidental expenses of salesmen.
3. Advertising, general publicity, direct advertising, and incidental expenses.

PRODUCTION EXPENSE:

1. All payments for services at the plant except for those employed in stripping.
2. All power and fuel consumed at the plant except that used in stripping.
3. Telephone, telegraph, oil, waste, etc.
4. New parts to replace others worn or broken with the freight or express charges on the same.
5. Depletion of land or royalty.
6. Compensation of liability insurance.
7. Fuel or power, labor and incidental expenses of the stripping gang.

First Concrete Boat Built in Nova Scotia

THE FIRST CONCRETE ship to be built in Nova Scotia and east of Montreal, was scheduled to be launched Dec. 1. It was built in North Sydney for W. N. Macdonald of Sydney by Ivan Bailey, who is in charge of the concrete construction work and Elias Gillard, master builder of St. John's, who is in charge of construction forms and designing. Work was commenced about three months ago. The dimensions are : 126 ft. long, 27 ft. beam and 12 ft. deep; capable of carrying between 450 and 500 tons. It will be equipped with oil engines and have a speed of about 10 knots. As soon as this boat is completed, a second, a three-masted schooner to be used as a beam trawler, will be started.



Steel Dredge "Elco" of the Empire Limestone Co., Buffalo, N. Y., for Digging Sand in the Niagara River

All-steel hull, manganese-steel buckets; Power plant consists of two 62-in. diameter boilers of 65 h. p. each, one main engine of 16x20 m. (right of ladder on plan); a 10 h. p. steam-turbine electric generator, seven steam hoisting engines (four spud engines, ladder engine, two steam winches for handling barges) and pumps for boiler feed water, wash water, etc.; Has office and storeroom facilities but no living quarters for crew

Why Banks Favor Trade Acceptances

Differs from Promissory Note—Serves Purpose of Currency—Wide Use Necessary to Meet After War Conditions

OUR NEW BANKING SYSTEM, provided for by the Federal Reserve Act, has been designed to stimulate finance and protect the Nation's commerce by pooling the normal reserves of our National banks. In this manner there is created an open discount market, and in this market there is no form of negotiable commercial paper that finds a heartier welcome than the Trade Acceptance.

The Trade Acceptance is only one of the features developed from conditions growing out of the operation of the Federal Reserve Act itself, as this form of commercial paper is not mentioned anywhere in the law, and while its importance is becoming more and more apparent, and touches closely many other phases of the act, it behooves us to seize upon the opportunities and advantages offered, and take unto ourselves, as both buyers and sellers, the profits that are possible by the use of this credit instrument.

Born of the Federal Reserve Act

Early in 1915 the Federal Reserve Board at Washington recognized the commercial facility which could be afforded by the use of the Trade Acceptance, and not only set about to initiate its use in commercial practice but gave it encouragement by issuing a regulation authorizing the Federal Reserve Banks to grant a preferential rate for the rediscount of Trade Acceptances over other forms of commercial paper, when rediscounted by member banks. The preference shown trade acceptances over other forms of commercial paper is normally $\frac{1}{2}$ per cent below rates for the same maturities.

In that regulation trade acceptances are referred to as a distinct class of commercial paper for which a rate of discount somewhat lower than that applicable to other commercial paper is suggested. It is distinct because the relation to a sale or purchase of goods is self-evident. Normally it represents a live account not yet due, and is not a note which may or may not be, but generally is, given to close a past-due account. The obligation of the purchaser is assumed, agreed to and a definite day is fixed for payment of the purchase price of the goods, and it is automatically double name paper.

Differs from Promissory Note

The trade acceptance, therefore, differs from the ordinary promissory note, in that a trade acceptance arises out of the purchase of goods and is drawn against an actually existing value; while a promissory note may be given to close a past-due account, or may be given for other purposes than for the purchase of goods, and may

be originated after the value has ceased to exist by the consumption, destruction, or permanent change in character of the commodities upon which the transaction was based. A discrimination in rate in favor of the trade acceptance is therefore quite logical.

Why the Lower Rate

It is not, however, necessary to be concluded that any trade acceptance is better than any plain note; for there are no doubt many single name notes that are as good or perhaps better credit risks than some trade acceptances. But the trade acceptance in general use merits the preferential rate for the following reasons, from a banking standpoint:

First—Avoiding the necessity, to a large extent, of analyzing detailed financial statements of the endorser or drawer. Instead of his own note for a large single amount, he offers the obligation in broken doses as he needs the funds, and has a joint maker in the acceptor, who would generally be rated.

Second—Running maturity, constituting a sort of installment payment on the indebtedness of the endorser or drawer.

Third—A continuing system of discount without creating an excessive line. The acceptance of a first series discounted would be nearing maturity and running off when the second series might be offered for discount.

Fourth—The complete segregation of the merchandise account from fixed capital invested, and when a business man has a fixed and unvarying "line" at a bank it means that either he has insufficient capital in his business or too much capital is tied up in past-due accounts or old stock, or both.

Fifth—Self-liquidation of accounts settled by trade acceptances. If you ask why a business man will pay acceptances, or have a higher regard for such an obligation than an open account, this question may be answered by citing the fact that the acceptance will not be as large as an open account, because the buyer will realize that he is furnishing the seller with a definite, tangible evidence of a commercial transaction with which the seller may finance his own business, either at his own bank or in the open market. Therefore, the acceptor will buy more prudently and employ better merchandising methods to sell the goods covered by the acceptance, and make his collections more promptly in order to meet the acceptance at maturity.

Whether or not the buyer stops to analyze what the effect is upon himself and his own business, he knows that his book

account will stay on the seller's ledger until he is ready to pay. When acceptances are freely used instead of book accounts, a general market will spring up for them, and they will be sought by investing commercial banks, regardless of the relations of the endorser with them.

The business man's trial balance will be much more attractive to the banker if instead of the item, "Accounts Receivable," he substitutes therefor the item, "Acceptances of Customers, per list attached," and in looking over these acceptances he finds pinned to them such notations as date of invoice, description of goods, etc., and every other indication that it is a live asset.

How the Buyer Benefits

In some instances the buyer pauses to consider whether the acceptance is not in reality a collection club to wield over him. While the use of trade acceptances will very materially tend to improve collections, there are many advantages to the buyer who accepts, and, fundamentally, what is good for one division of our commercial interests is good for all.

The trade acceptance is of especial benefit to the buyer of limited capital, and enables him to make his turnovers without the necessity of large borrowing from his local bank in order to discount his bills, so that he may compete successfully with his neighbors in the same lines who may have more capital or better banking facilities, which enable them to take advantage of trade discounts.

When a buyer accepts a time draft drawn on him by the seller of the goods, maturing upon a date convenient for him to pay it, he is furnishing the house from which he buys with a tangible asset upon which it can realize one hundred cents on the dollar, and he is making his account with that house attractive, so that it will always accord to him its very best terms and lowest prices. On the other hand, when the buyer makes purchases on open account, he is furnishing the seller of the merchandise with an intangible asset upon which he can perhaps realize fifty or sixty cents on the dollar, and only with a large amount of bother. Therefore, the acceptance is a distinct opportunity for a cordial co-operation between the buyer and the seller. It also opens up a possibility of lower prices by cutting overhead, in which there is no more important item than the cost of capital.

Every buyer desires to strengthen his credit, and this can be done in no more definite way than to make his account as attractive as possible with those from

whom he buys. The following advantages to the buyer should be self-evident:

Develops careful buying.

Enables him to keep better track of his outstanding obligations, thereby avoiding the evils of over-extension.

Enables him to realize that credit is as tangible as cash and should be guarded and used accordingly.

Helps the buyer by making him deal always in current transactions rather than in long drawn out book accounts.

As the buyer often becomes the seller, the same advantages that apply to the seller apply to him.

Prevents the accumulation of over-due accounts.

Basis of a Currency Issue

The Federal Reserve Act seeks more than anything else to make credit circulate, therefore the elasticity of a currency medium is the essential thing and all else a means to that end. An acceptance given for commercial purposes is made the basis of a currency issue. The advantage, therefore, of converting book accounts into trade acceptances is that an instrument for creating that which can be disposed of to a banker can become the basis of currency issue, if necessary.

Accounts receivable are the seller's tools of trade and mean more to him than to anyone else. Their tangible value is limited according to his ability to collect them. They represent uncertified entries by only one of the parties involved, and guarantee nothing regarding the quantity, quality, price, delivery of the goods, or the date of payment therefor. A statement may be sent out in the usual way and receive no response; ten days elapse, and a letter is written; ten days more without any response, and a draft is threatened. Sometime later a salesman calls and the account is closed with a note. So much capital is absorbed until the note becomes due.

Cheapening Credit

In the meantime, the buyer has perhaps sought other sources of supply, obtained credit upon an open book account, and credit is cheapened and expanded without warrant.

An account closed by a trade acceptance is also closed as to terms of payment, price, quality, quantity and delivery. It is presented by a bank who usually owns it at maturity. It is already a signed credit obligation, and presents evidence of a live commercial transaction. A lower rate is assured in financing business with acceptances than by open borrowing. Then why not let the seller print on his letterheads and invoices a clause that if the account is closed by a given number of days with acceptances, an additional discount of a justifiable percentage will be allowed. A buyer who is giving trade acceptances and meeting them promptly, could very grace-

fully insist upon such terms because his account is worth more to the seller.

Should Be Used at Present

The use of trade acceptances will go a very long way toward strengthening our commercial and banking institutions at this time when the entire economic life of the nation is called upon to save, to eliminate lost motion, to strengthen the resources of the nation. But it is not only for the present that this rearrangement is advocated. Now that the world conflict has ceased a far-reaching readjustment is imperative. We must try to keep our house in order to sustain America in its world position among the nations; and no better commercial weapon will be at our disposal than the trade acceptance, if its use is fully developed.

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Bankers Favor Permanent Capital Issues Body

NEW YORK—That some body similar to the Capital Issues Committee should be formed to succeed to its functions was the unanimous opinion voiced at a meeting of the full committee of the Second Federal Reserve district in the directors' room of the Federal Reserve Bank of this district recently.

The meeting resolved itself into an interchange of views on the suggestion that a permanent Capital Issues Committee be formed.

All of those present said that they recognized the danger of a flood of wildcat promotions after peace is declared and the restrictions on capital issues enforced as a war time measure are lifted. They agreed that some legislation is necessary to cover the situation. The suggestion was made that the government should form a body which should pass on all new issues, and in this way head off possible fraudulent and wildcat schemes before they can be launched. This, in particular, is where the present Capital Issues Committee performed a valuable service to the public, it was explained.

The conclusion reached was that the views should be embodied in a report to the national Capital Issues Committee in Washington and also to the Treasury Department.

Sensibar and Foley Take Over Magnesite Plant

J. R. SENSIBAR and J. A. Foley, of the Construction Materials Co., Chicago, producers of lake sand, have taken over the plant and business of the American Magnesia Products Co., makers of "Kragstone," a trade name for a cement of which the basic properties are magnesite and chloride.

The American Magnesia Products Co. will be operated by the Construction Ma-

terials Co. from the office of the latter company in the Chamber of Commerce. The old Kragstone plant on West 12th-st will be retained temporarily while a new one is being planned. The company obtains its magnesite from southern California. H. S. Heavenrich, production manager of the Kragstone plant, will remain in that position.

Mr. Sensibar was influenced in the purchase of this business because he saw in it a great future as "The Stucco Beautiful." The company's literature declares these features: Kragstone can be applied in zero weather without injury by using a non-freezing solution; it has great tensile strength; is non-checking, non-cracking; is pure white and does not discolor; is fire-proof, stormproof, waterproof; ideal material for overcoating old buildings and in remodeling work; it will adhere to almost any surface.

Sand and Gravel Industry Big in Pittsburgh

PITTSBURGH, Pa.—The development of the sand and gravel business in the Pittsburgh district has been so great that it is obtaining greater and greater attention and the assumption has been made that outside of the iron and coal business it is probably of greatest magnitude. This impression has grown with the constantly increasing number of dredges, steamboats and flats in the various rivers of the region, and with the advent of larger and larger dredges and boats hauling sand and gravel.

Silica Sand Men Discuss Future Business

PITTSBURGH, Pa.—To determine how to meet the great reconstruction demands for their products, the American Sand Association, which represents 70 plants supplying the iron and steel trade of America with gray iron and steel molding sands, met November 13 in the William Penn hotel. H. C. Koontz, of the Superior Sand Company, of Cleveland, presided. It was said France alone will spend \$5,000,000,000 in this country for reconstruction work.

Silica Sand Association Appoints Secretary

OTTAWA, Ill.—Knafel Penaire, of New Orleans, an employe of the Southern Pacific Railway Co., was elected secretary of the Silica Sand Association of Illinois at a recent meeting of the organization at its offices in the Central Life Building.

The new secretary's duties will be to secure improved car service for the Illinois Valley sand shippers and to enlarge the field for the use of silica sand.

Government Will Offer Aid in Every Form for Reconstruction Period

War Industries Board Chairman Announces Policy of Encouragement to Private Construction—Other Federal Heads Give Out Plans for Necessary Governmental Peace Building

BUILDING INTERESTS throughout the country may plan with full assurance of Federal and financial support for the greatest peace time Government and private construction era the country has ever known, according to official information given to Ford H. Dow, of the Dow Service Daily Building Reports by heads of the various construction divisions of the Government at Washington when the war-time restrictions on building construction were raised by the War Industries Board.

Bernard M. Baruch, Chairman of the War Industries Board, said that it was the intention of the Federal authorities to encourage private construction to the utmost without further delay. The present policy applies to the manufacture of building materials, systems of distribution by rail or water, financing of building projects and actual construction. Labor in any quantity desired will be made immediately available to any contractor who wants it and there will be full co-operation by the fuel and railroad administrations. The same consideration and encouragement will be given to road construction, sewer work and street paving as in all other forms of municipal construction or improvement in the domestic market.

Export Business in Sight

D. R. McLennan, of Chicago, who has been serving as Chief of the Non-War construction Section of the War Industries Board, said:

"You may state with authority that there will be a heavy export movement for all building materials just as soon as ships come off the ways to carry it over." France will spend \$680,000,000 for immediate reconstruction work. This fund has already been appropriated.

Capt. Kenneth Murchison, of New York, speaking for Col. W. A. Starrett, Chief of the Emergency Construction division of the War Department, said:

"The emergency war construction department is immediately to proceed to close down. All necessary construction work in this department will be handled by the regular division of the War Department. There will be no more hospital construction, but where additional hospitals are needed the cantonments in various sections of the country will be remodelled to serve as hospitals."

Many Postoffices to Be Built in 1919

James A. Wetmore, supervising architect for the Treasury Department, said:

"Construction work in this department which has been deferred during the war will proceed at once upon a very important scale. For instance, we will announce within a few days that we will receive estimates on the construction of 38 postoffice buildings of the highest type of construction which will be received in January. A few days later we will call for estimates on 32 additional structures of the same high type of construction which will also be ready for letting in January. Immediately following that announcement another call for bids on the construction of 45 additional postoffices will be released for estimates to be received sometime in February. All of these structures will average \$500,000 in cost and this is only a part of the construction work to be released by this department."

More Yards and Docks

R. J. Potbury, Chief of the Plan and Specification Department of the Bureau of Yards and Docks, said:

"The volume of work that has come out of this bureau in war time will still be important in peace time for there is a vast quantity of necessary non-war construction that has been deferred during the war that is vital to the Government's peace program and this work will now proceed on a fair scale."

Big Year Ahead for Cement

Portland cement is in for the biggest year in its history. Production during the next twelve months no doubt will exceed the greatest quantity of cement ever turned out in the United States, namely, approximately 93,000,000 barrels. The kilns in all parts of the country have been promised coal and labor and some are actually at work producing cement to the utmost of their capacity.

Throughout the country shipments totaled almost 11,000,000 barrels in October, 1916; a little over 9,000,000 barrels in 1917 and only 6,250,000 barrels in this year, representing a loss in volume shipped of approximately 33 per cent. For the first 10 months of 1916 the shipments were almost 81,931,000 barrels; in 1917, they were around 79,000,000 barrels and this year shipments totaled only 63,500,000 barrels, representing a loss from last year's volume

of approximately 20 per cent. In zones 1 and 2, representing the two manufacturing sections supplying New York the 10 month's losses were 20 per cent in zone 1 and 22 per cent in zone 2.

Cement Trade of South America

The Portland cement interests of the country at its annual convention at the Biltmore, New York, in December, will perfect a world wide and domestic promotion campaign for American cement in the hope of winning, particularly in South America, the huge German cement trade that American cement manufacturers heretofore could not touch. The domestic price for this commodity probably will not be advanced until spring and contractors or architects figuring this commodity should make allowances for advances that now seem sure to come sometime after the first of the year.

The dawn of the new era in building construction has not registered in actual orders to any appreciable extent in building material dealers' yards in any section of the country. The change about came so suddenly that except for necessary work that was ready immediately to proceed, there is comparatively little work ready for actual delivery of materials. Architects' offices throughout the country have been disorganized for more than two years and clients have shown various inclinations about proceeding with work until some official information was obtainable from proper authorities at Washington as to what the Federal policy will be toward permitting construction work to proceed.

There is a probability that the Capital Issues Committee will continue to exercise power as to the flotation of securities for regulatory purposes until after the next Liberty Loan, but the Dow Service is assured that it will be the Government's policy to encourage financial institutions to permit general construction to proceed.

Specifies Hydrated Lime

NEW STANDARD specifications issued by the Bridge Department of the Tennessee Highway Commission call for 40 lbs. of hydrated lime per cubic yard to be used in all bridge concrete in the future. This specification bears the stamp of approval of the Office of Public Roads, Washington, D. C.

Who's Who in the Rock Products Industry

George D. Van Sciver, Chairman of the Philadelphia District, Committee on Mineral Aggregates

PHILADELPHIA PRODUCERS of mineral aggregates enjoy the distinction of being the only group of producers who have had actual experience with a co-operative pooling arrangement under Government sanction. Other districts had reached a point where such an arrangement would soon have gone into effect, but the Philadelphia district can actually boast of several months' experience.

Long before the formation of the committee on mineral aggregates, during the early part of the war period, it was apparent a large demand would be made on the Philadelphia district and vicinity for sand, gravel and crushed stone, and it appeared a collective supervision would be necessary in order to render the best of service to the Government and to the general contractors on essential construction work. Therefore a local committee, comprising those producers situated in the Philadelphia district, was formed and known as "The Metropolitan District Committee."

After a short time it became very evident considerable attention would have to be devoted to the sand, gravel and stone industries, and several meetings of the War Industries Board were held, which brought about a War Service Committee on Mineral Aggregates, and the section covering Pennsylvania east of the Susquehanna river, New Jersey south of Trenton, and the state of Delaware, was classed as Group No. 3.

It was an intimate knowledge of the Philadelphia situation which probably prompted some of the action taken by the chief of the building materials section of the War Industries Board which did not meet with much favor in other parts of the country, where conditions were reversed and the possible supply of materials was greatly in excess of the demands.

Van Sciver Made District Chairman

When the Washington meeting which resulted in the formation of the War Service Committee on Mineral Aggregates took place, George D. Van Sciver, of Philadelphia, was already serving as chairman of the local committee and was, of course, the logical chairman of District No. 3. Due to his long experience and high standing in the building industry and to his untiring loyal energies, the work of both committees has made a notable record of co-operative, patriotic service in the rock products industries.

Mr. Van Sciver is probably one of the two or three largest producers of sand and

gravel in the United States (and doubtless in the world). Two or three producers in the metropolitan districts of New York and Baltimore are probably the only ones who produce anywhere near the tonnage of Mr. Van Sciver's plants. This great business is the result of 20 years' creative effort in an industry which was in its infancy when Mr. Van Sciver began his operations.

History of a Successful Operator

In the latter part of the year 1899 Mr. Van Sciver, who had prior to this time



George D. Van Sciver

successfully conducted a merchandise business, discovered a large and valuable deposit of sand located at Hainesport, N. J., where the old Van Sciver homestead was situated. After making a complete investigation of the sand business, he believed the same principles which he had used successfully in another line of business would be applicable to the sand business, and therefore he decided to build up a business along standard lines and to produce sand which would be uniform and of quality. To make effective his plans, the Hainesport Mining & Transportation Co. was organized, and immediately started to produce Jersey sand to be used in the Philadelphia market and vicinity.

Prior to the carrying out of Mr. Van Sciver's ideas regarding quality and uniformity, little attention had been paid to building sands, particularly those used in cement and concrete work, and it was after much hard work and trouble that the con-

suming trade was convinced of the good qualities to be found in Jersey sands when they were taken from good deposits and properly prepared.

The first plant started with a capacity of about 150 cu. yds. per day. This grew rapidly until it was found necessary to establish a new plant at Bridgeboro, N. J., where one of the most up-to-date plants for washing and preparing Jersey sand was built. This was completed about 1914, and has a capacity of 4,000 yds. per day.

Begins Dredging Operations

Another form of sand was used in Philadelphia, principally for lime mortars under the trade name of "Bar Sand," and in 1904 the dredge "Independence" was constructed, and this dredge is operating today with an approximate capacity of 1,200 yds. per day.

Having been successful in rendering a real service to the building business, Mr. Van Sciver decided that the engineers and contractors of Philadelphia and vicinity would use gravel the same as was being used by the Government departments in larger cities, provided it was properly prepared. So in 1910 the dredge "Neptune" was launched. This dredge was operated until 1913 when it was destroyed by fire. During its short working life Mr. Van Sciver was convinced that he was "on the right track," and in 1914 the dredge "Philadelphia" was launched and put in operation, having a still greater capacity and facilities for crushing gravel as well as for sizing and washing sand. This dredge is still operating with a capacity of 5,000 tons a day. In the early part of 1918, Mr. Van Sciver's good foresight told him an extraordinary demand was to be made on mineral aggregates in Philadelphia and vicinity and a new dredge was started, and about one month ago it was placed in operation. This is the dredge "Liberty" used for dredging and preparing gravel, and has a capacity similar to that of the dredge "Philadelphia."

Complete Transportation System

In order to render the proper service it was necessary during all the years above mentioned to equip a thorough system of transportation. This has been well done, and it has grown to be a very large working unit in itself, in so much as it requires seven tugs and 64 large barges to handle the present output of the Van Sciver plants.

In 1906 it developed that some arrangements would have to be made for the dis-

tribution of the fast growing output of the Hainesport Mining & Transportation Co., so the De Frain Sand Co., which operated a wharf at Otis-st on the Delaware river, Philadelphia, was acquired. The plant was immediately improved and equipped with Van Seiver ideas, and its growth was very rapid, so much so that larger quarters soon had to be secured and greater unloading and storage facilities added. Therefore in 1908 a new and larger wharf was completed at Beach and Berks-sts on the Delaware river, where will be found a most up-to-date unloading and re-loading plant for the handling of building materials.

Crushing and Storage Plants

In dredging gravel from the river bed, it is necessary to remove the large gravel as well as the smaller material. The large gravel is loaded on barges and transported to the wharf at Beach and Berks-sts, where it is passed through two up-to-date crushing plants having a capacity of 2,000 tons per day, and the gravel is there made into marketable sizes.

The plant includes facilities for loading 100 open top cars per day, and has a capacity for loading by gravity from overhead bins an unlimited amount per day. Besides the gravity loading facilities, large stock piles have been arranged for with a capacity of over 75,000 tons whereby deliveries during the winter time period are not interrupted.

Along with the large wharf and plant at Beach and Berks-sts, another yard for distributing the river products was established at Christian-st on the Schuylkill river with the same facilities as are found at Beach and Berks-sts. The object of the company was to have a distribution system so that between the two yards all points of consumption could be reached promptly, and the highest grade of service rendered.

The company distributing the materials by barge, cars and truck is still known as The De Frain Sand Co.; the Hainesport Mining & Transportation Co. taking care of the producing and marine end of the business.

Also Lime Manufacturer

In the early part of 1915 the Van Seiver interests acquired control of the Knickerbocker Lime Co., and this is not only one of the largest retail distributing yards in Philadelphia, but also holds the position of being one of the largest manufacturers of lime products east of the Ohio river.

Each of the companies named above has the personal supervision of Mr. Van Seiver, who holds the office of president in each company, and he has surrounded himself with a thorough and competent organization.

Every producer in the rock products field should make it a point to attend the Road Congress in Chicago on December 11 and 12. Plans for the reconstruction period will be discussed.

Wm. M. Kinney Now the General Manager of Cement Association

THE Portland Cement Association announces the appointment of Wm. M. Kinney as general manager to succeed H. E. Hiltz, resigned.

Mr. Kinney has been connected with the cement industry in cement and concrete promotion work for over 11 years, having occupied for the past four years the positions of engineer, promotion bureau and



William M. Kinney

inspecting engineer of the Universal Portland Cement Co.

He is an associate member of the American Society of Civil Engineers and American Railway Engineering Association, a member of the American Society for Testing Materials, American Concrete Institute, Western Society of Engineers, Engineers' Club of New York, Engineers' Club of Philadelphia, and Chicago Engineers' Club. He has been particularly active in the work of the American Society for Testing Materials, being vice-chairman of Committee C-1 on Cement and a member of the Executive Committee. He is a member of the Executive Committee, and secretary of the Committee on Concrete Roads and Pavements of the American Concrete Institute.

Mr. Kinney was largely instrumental in establishing the Structural Materials Research Laboratory at Lewis Institute, Chicago, under the direction of Prof. D. A. Abrams, and has been since its inception, a member of the Advisory Committee.

Alsen's Cement Works Now in Receiver's Hands

ALSEN'S American Portland Cement Works of New York (Greene county), one of the oldest cement plants in the United States, seized by the Alien Property

Custodian early in the year, is now in the hands of a receiver. Official notice to this effect was sent out under date of November 25 by J. W. Kittrell, treasurer, 277 Broadway, N. Y.

The notice states:

"By order of the United States District Court, Southern District of New York, Mr. George R. Walker, 59 Wall street, New York City, has been appointed receiver in bankruptcy of this company. Mr. Walker, by designation of the Alien Property Custodian, has been acting as a director of this company, and has been the president of the company, in recent months.

"The plant has been shut down for nearly a year, and the claims of its creditors are now long past due. During this time, the creditors have all shown unusual patience and coöperation by refraining from pressing their claims or bringing suits. This has been done for the best interests of all, including the interests of the United States Government.

"All of the capital stock of this company, together with certain of its outstanding bonds, are now held by the Alien Property Custodian.

"Recently, one of the smaller creditors brought a suit against the company, and obtained a judgment for about \$450. This, of course, made other creditors anxious and numerous other creditors immediately began to press their claims and threaten suit, and it seemed therefore necessary, as a conservation measure and in order to protect the interests of all creditors, that steps should be taken immediately to save the property.

"The Board of Directors therefore felt it was its duty to consent to the appointment of a receiver in said bankruptcy proceeding."

Geological Survey Prepares New Forms for Lime Statistics

NEW QUESTIONAIRES for producers of lime are in preparation by G. F. Loughlin, in charge of lime statistics of the U. S. Geological Survey.

Owing to the fact that the war created so many uses for lime in the production of munitions, a new form of questionnaire is necessary to develop statistics on this branch of the industry.

The assistance of the Lime Association was sought by the survey and many of the suggestions of the association are being incorporated in the forms.

Later further notice will be sent to members of the association on the issuance of this questionnaire. It is hoped that full coöperation will be given by the members to the Geological Survey that this important work may be complete and accurate.



NEW MACHINERY EQUIPMENT



Automatic Weighing Bagging Machines

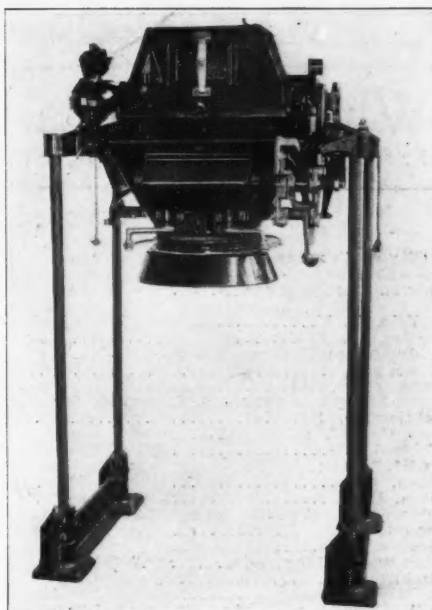
A SINGLE-UNIT automatic weighing and bagging machine which it is believed will fill the needs of the small producer of agricultural limestone, or of chicken grits and the like material, is made by the Automatic Weighing Machine Co., Newark, N. J. The machine, illustrated herewith, is not adapted to hydrated lime or other material which will not flow by gravity or which requires compression to fill the sack.

The automatic scale consists of a main hopper or frame, upon which is carried an "equal arm" scale beam with the bag hopper at one end and the weighing weights at the other. The bag hopper carries the clamping device, which is not connected with the weighing mechanism.

This machine weighs directly into the sack, and utilizes the principle of a large stream for the greater portion of the predetermined weight, and a small or "drip" stream for finishing.

In one operation the bag is placed in position, automatically clamped, and the machine started, by pulling a lever, through which the valves are opened, and the material flows into the sack in a full stream. When the load is nearly completed the stream of material is automatically reduced to a small "drip," thereby insuring great accuracy of weight. When the sack is filled, the operator reverses the starting lever and the bag drops to the floor, conveyor or hand truck, as desired.

The machine can be supported from floor, either stationary or portable, or suspended from overhead either bin or trolley. The capacity claimed for this bagger is from 5 to 6 bags per minute, which is something like from 200 to 250 tons per day—about the same as the average capacity of a mill and screen unit.



Combination automatic weighing and bagging machine

The machine has already been extensively used in the fertilizer industry.

New Adaptation of Wagon Loader

THE Link-Belt Co., of Philadelphia and Chicago, has brought out a modification of the standard wagon loader, which promises to have a variety of new uses. This is called a "storage loader," and consists of a regular wagon loader, on the front end of which is pivotally mounted a light belt conveyor, swinging in a semi-circle, and inclined upwards slightly. This runs at a speed sufficient to throw the material to some extent, and pile it in an open space to a depth of as much as 12 to 13 ft.

The device is adapted to handle coal, gravel, sand, stone, or any other material of moderate size, and will be particularly useful in many plants for storing coal when it can be obtained in summer or fall, and reclaiming it as needed in winter.

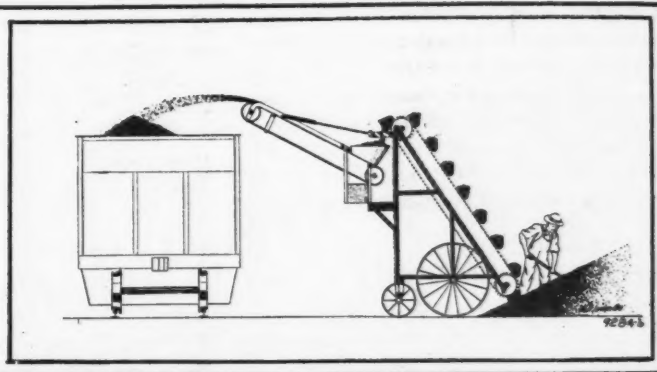
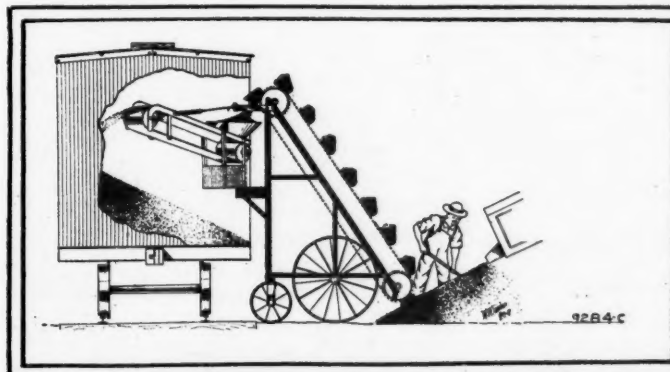
By pointing the pivoted belt to one end or the other of the box car, the car can be loaded to capacity, with practically no hand trimming, and with the use of only one man to feed to the loader at the foot wheel.

Economy of Steam Shovel Quarry Operation

IT HAS been found by investigation in many quarries, writes Oliver Bowles, in Bulletin 160 of the Bureau of Mines "Rock Quarrying for Cement Manufacturer," that the quarry costs per ton of rock obtained, are, as a general rule, much lower where the churn drill and steam shovel are employed than where smaller drills and hand-loading methods are used. This is shown more clearly by figures obtained from various quarries.

The average total operating or working cost of delivering rock to the crusher—stripping not being included—for 11 quarries employing the hand-loading selective method was 27.4 cents per ton. The highest cost was 35 cents per ton and the lowest 18 cents. The average of the same operation costs for eight quarries employing steam-shovel methods was 21 cents per ton. The highest was 32 cents per ton and the lowest 12 cents. As indicated by these figures, the costs may be reduced about 23 per cent by the use of steam shovels.

Buy War Savings Stamps to the utmost of your financial capacity, and then increase your capacity by saving more.



Two methods of using this modification of the standard wagon loader called a "storage loader," which has a variety of uses

The Rock Products Market

Agricultural Limestone Wholesale at Plant, per Ton

EASTERN:	
Coldwater, near Rochester, N. Y.—(80% thru 100 mesh) Analysis, CaCO ₃ , 56.77%; MgCO ₃ , 41.74%....	2.25@2.65
Danbury, Conn.—(50% thru 100) Analysis, CaCO ₃ , 96%; MgCO ₃ , 2%; ppr., \$4.00; bulk.....	2.75
Hillsville, Pa.—(90% thru 100 mesh) in 80 lb. ppr. bags, \$4.50; bulk.....	3.00
Jamestown, N. Y.—(90% thru 100 mesh)—Bags.....	2.50
Pownal, Vt. (50% thru 100) Analysis, CaCO ₃ , 96%; MgCO ₃ , 2%; ppr., \$4.00; bulk.....	2.75
Walford, Pa.—(70% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 100% thru 10 mesh; 50% thru 4 mesh), paper sacked.....	5.00
Bulk.....	3.00
West Stockbridge, Mass.—(50% thru 100) Analysis, CaCO ₃ , 96%; MgCO ₃ , 2%; ppr., \$4.00; bulk.....	2.75
CENTRAL:	
Alton, Ill.—(Pulv. and 90% thru 50 mesh; 90% thru 4 mesh) Analysis, CaCO ₃ , 96%; MgCO ₃ , 75%.....	2.00
Bedford, Ind.—(90% thru 10 mesh) Analysis, CaCO ₃ , 98.5%; MgCO ₃ , 0.5%.....	1.75
Columbia, Ill., near East St. Louis —(1/2" down).....	1.25@1.80
Elmhurst, Ill.—Analysis, CaCO ₃ , 29.43%; MgCO ₃ , 20.69%.....	1.00
Greencastle, Ind.—(50% thru 50 mesh) Analysis CaCO ₃ , 98%.....	1.75
Lannon, Wis.—(50% thru 50 mesh) Analysis, 53.35%, CaCO ₃ ; 43.27% MgCO ₃	2.00
Marble Cliff, O.—(50% thru 100 mesh) Analysis, CaCO ₃ , 86%; MgCO ₃ , 8%.....	3.00
Marblehead, O.—(50% thru 100 mesh; 60% thru 50 mesh; 100% thru 10 mesh)—Analysis (Min.), CaCO ₃ , 32.03%; MgCO ₃ , 3.75%.....	4.50
Bulk, \$3.00; ppr. 80 lb. sack.....	.75@1.00
McCook, Ill.—(90% thru 4 mesh)....	
McCook, Ill.—(100% thru 1/2" sieve; 78:12% thru No. 10; 53:29% thru No. 20; 38:14% thru No. 30; 26:04% thru No. 50; 16:27% thru No. 100) Analysis, CaCO ₃ , 54.10%; MgCO ₃ , 45.04%.....	1.00@1.25
Milltown, Ind.—Analysis, CaCO ₃ , 98%.....	1.50
Montrose, Ia.—(90% thru 100 mesh) 1.25@1.50	
Muskegon, Mich.—(50% thru 50 mesh) Analysis, CaCO ₃ , 53.35%; MgCO ₃ , 43.27%.....	1.50@2.00
North Industry, O.—(50% thru 100 mesh; and pulverized limestone) Analysis, CaCO ₃ , 91%; MgCO ₃ , 1.63%.....	3.00
Piqua, O.—(50% thru 100 mesh)....	2.50@4.00
Rockford, Ill.—Analysis, CaCO ₃ , 53.75%; MgCO ₃ , 44.35%.....	1.25
Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru 1/2" mesh) Analysis, CaCO ₃ , 89.61 to 89.91%; MgCO ₃ , 3.82%.....	1.50
Stone City, Ia.—(50% thru 100 mesh).....	.50
Whitehill, Ill.—(50% thru 50 mesh), Analysis, CaCO ₃ , 96.12%; MgCO ₃ , 2.50%.....	1.25@1.50
SOUTHERN:	
Brooksville, Fla.—Pulverized limestone.....	1.80
Cartersville, Ga.—(50% thru 100 mesh) Analysis, combined carbonates, 96%.....	3.50
Fletcher, N. C.—(100% thru 10 mesh) Analysis, CaCO ₃ , 90%; MgCO ₃ , 80%. Paper, \$3.75; bulk..	2.25
Irvington, Ky.—(50% thru 4 mesh).....	1.90

(Continued on next page.)

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone	
City or shipping point	Screenings, 1/4 inch down
EASTERN:	
Auburn and Syracuse, N. Y.	.80
Buffalo, N. Y.	1.00, all sizes from bins.
Burlington, Vt.	2.50
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10
Grove, Md.	2.25
Hagerstown, Md.	2.00 for all sizes
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast
Quarryville, Pa.	.80
Rock Cut, N. Y.	1.20
Walford, Pa.	1.25
CENTRAL:	
Alden, Ia.	.20
Alton, Ill.	1.85
Columbia, Ill. (near E. St. L.)	1.25@1.80
Detroit, Mich.	.85@1.20
Dundas, Ont.	.65
Eden and Brillion, Wis.	.80@1.00
Elmhurst, Ill.	1.00
Ft. Wayne, Ind.	Various sizes \$1.60 per net ton
Hull, Canada.	1.20
Greencastle, Ind.	1.00@1.25
Illinois, Southern.	1.50
Lannon, Wis.	1.25
Lima, Ohio	1.00
Linwood, Scott Co., Ia.	.50
Mankato, Minn.	.70@.75
Mayville, Wis.	.70@.75
McCook, Ill.	\$1.00@1.25
Oshkosh, Wis.	1.50@1.65
Ottawa, Can.	2.00
River Rouge, Mich.	.95@1.00
Rockford, Ill.	1.25
Sherman and Hamilton, Wis.	1.00 in all sizes, Blue Limestone
Stone City, Ia.	1.90
Toledo, Ohio.	.60@1.00
Toronto, Can.	1.55
SOUTHERN:	
Brookville, Fla.	.50
Fort Springs, W. Va.	1.60
Irvington, Ky.	.75
Ladds, Ga.	2.40
Mascot, Tenn.	.75
Stephensburg, Ky.	1.20
Winnfield, La.	1.20
WESTERN:	
Atchison, Kans.	.50
Blue Sprgs. & Wymore, Neb.	.15
Carthage, Mo.	1.50
El Paso, Tex.	.60
Kansas City, Mo.	.60
Crushed Trap Rock	
City or shipping point	Screenings, 1/4 inch down
Baltimore, Md. (vicinity)—	1.25
Birdsboro, Pa.	1.25
Branford, Conn.—Trap.....	1.00
Duluth, Minn.—Trap.....	.65@.75
Glen Mills and Rock Hill, Pa.—Trap.....	1.10
Little Rock, Ark.—Trap.....	1.75
Millington, N. J.	1.85
Montrose, Ia.—Trap.....	1.10@1.20
Morristown, N. J.—Trap.....	1.85
New Britain, Conn.—Trap.....	.75
North Branford, Conn.—Trap.....	.80
Richmond, Cal.—Trap.....	.60
Westfield, Mass.—Trap.....	.60
Miscellaneous Crushed Stone	
City or shipping point	Screenings, 1/4 inch down
Brooksville, Fla.—Flint.....	1.00
Fair Oaks, Calif.—Cr. Bldrs....	.85
Hendlers, Pa.—Quartzite.....	.75
Little Falls, N. Y.—Syenite....	.60
Richmond, Va.—Granite.....	1.75
Stephensburg, Ky.	1.26
Stockbridge, Ga.—Granite.....	.50
Toledo, O.—Slag.....	.75@1.25
Crushed Limestone	
City or shipping point	Screenings, 1/4 inch down
Buffalo, N. Y.	1.00, all sizes from bins.
Burlington, Vt.	2.50
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10
Grove, Md.	2.25
Hagerstown, Md.	2.00 for all sizes
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast
Quarryville, Pa.	.80
Rock Cut, N. Y.	1.20
Walford, Pa.	1.25
CENTRAL:	
Alden, Ia.	.20
Alton, Ill.	1.85
Columbia, Ill. (near E. St. L.)	1.25@1.80
Detroit, Mich.	.85@1.20
Dundas, Ont.	.65
Eden and Brillion, Wis.	.80@1.00
Elmhurst, Ill.	1.00
Ft. Wayne, Ind.	Various sizes \$1.60 per net ton
Hull, Canada.	1.20
Greencastle, Ind.	1.00@1.25
Illinois, Southern.	1.50
Lannon, Wis.	1.25
Lima, Ohio	1.00
Linwood, Scott Co., Ia.	.50
Mankato, Minn.	.70@.75
Mayville, Wis.	.70@.75
McCook, Ill.	\$1.00@1.25
Oshkosh, Wis.	1.50@1.65
Ottawa, Can.	2.00
River Rouge, Mich.	.95@1.00
Rockford, Ill.	1.25
Sherman and Hamilton, Wis.	1.00 in all sizes, Blue Limestone
Stone City, Ia.	1.90
Toledo, Ohio.	.60@1.00
Toronto, Can.	1.55
SOUTHERN:	
Brookville, Fla.	.50
Fort Springs, W. Va.	1.60
Irvington, Ky.	.75
Ladds, Ga.	2.40
Mascot, Tenn.	.75
Stephensburg, Ky.	1.20
Winnfield, La.	1.20
WESTERN:	
Atchison, Kans.	.50
Blue Sprgs. & Wymore, Neb.	.15
Carthage, Mo.	1.50
El Paso, Tex.	.60
Kansas City, Mo.	.60
Crushed Trap Rock	
City or shipping point	Screenings, 1/4 inch down
Baltimore, Md. (vicinity)—	1.25
Birdsboro, Pa.	1.25
Branford, Conn.—Trap.....	1.00
Duluth, Minn.—Trap.....	.65@.75
Glen Mills and Rock Hill, Pa.—Trap.....	1.10
Little Rock, Ark.—Trap.....	1.75
Millington, N. J.	1.85
Montrose, Ia.—Trap.....	1.10@1.20
Morristown, N. J.—Trap.....	1.85
New Britain, Conn.—Trap.....	.75
North Branford, Conn.—Trap.....	.80
Richmond, Cal.—Trap.....	.60
Westfield, Mass.—Trap.....	.60
Miscellaneous Crushed Stone	
City or shipping point	Screenings, 1/4 inch down
Brooksville, Fla.—Flint.....	1.00
Fair Oaks, Calif.—Cr. Bldrs....	.85
Hendlers, Pa.—Quartzite.....	.75
Little Falls, N. Y.—Syenite....	.60
Richmond, Va.—Granite.....	1.75
Stephensburg, Ky.	1.26
Stockbridge, Ga.—Granite.....	.50
Toledo, O.—Slag.....	.75@1.25
Crushed Limestone	
City or shipping point	Screenings, 1/4 inch down
Buffalo, N. Y.	1.00, all sizes from bins.
Burlington, Vt.	2.50
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10
Grove, Md.	2.25
Hagerstown, Md.	2.00 for all sizes
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast
Quarryville, Pa.	.80
Rock Cut, N. Y.	1.20
Walford, Pa.	1.25
CENTRAL:	
Alden, Ia.	.20
Alton, Ill.	1.85
Columbia, Ill. (near E. St. L.)	1.25@1.80
Detroit, Mich.	.85@1.20
Dundas, Ont.	.65
Eden and Brillion, Wis.	.80@1.00
Elmhurst, Ill.	1.00
Ft. Wayne, Ind.	Various sizes \$1.60 per net ton
Hull, Canada.	1.20
Greencastle, Ind.	1.00@1.25
Illinois, Southern.	1.50
Lannon, Wis.	1.25
Lima, Ohio	1.00
Linwood, Scott Co., Ia.	.50
Mankato, Minn.	.70@.75
Mayville, Wis.	.70@.75
McCook, Ill.	\$1.00@1.25
Oshkosh, Wis.	1.50@1.65
Ottawa, Can.	2.00
River Rouge, Mich.	.95@1.00
Rockford, Ill.	1.25
Sherman and Hamilton, Wis.	1.00 in all sizes, Blue Limestone
Stone City, Ia.	1.90
Toledo, Ohio.	.60@1.00
Toronto, Can.	1.55
SOUTHERN:	
Brookville, Fla.	.50
Fort Springs, W. Va.	1.60
Irvington, Ky.	.75
Ladds, Ga.	2.40
Mascot, Tenn.	.75
Stephensburg, Ky.	1.20
Winnfield, La.	1.20
WESTERN:	
Atchison, Kans.	.50
Blue Sprgs. & Wymore, Neb.	.15
Carthage, Mo.	1.50
El Paso, Tex.	.60
Kansas City, Mo.	.60
Crushed Trap Rock	
City or shipping point	Screenings, 1/4 inch down
Baltimore, Md. (vicinity)—	1.25
Birdsboro, Pa.	1.25
Branford, Conn.—Trap.....	1.00
Duluth, Minn.—Trap.....	.65@.75
Glen Mills and Rock Hill, Pa.—Trap.....	1.10
Little Rock, Ark.—Trap.....	1.75
Millington, N. J.	1.85
Montrose, Ia.—Trap.....	1.10@1.20
Morristown, N. J.—Trap.....	1.85
New Britain, Conn.—Trap.....	.75
North Branford, Conn.—Trap.....	.80
Richmond, Cal.—Trap.....	.60
Westfield, Mass.—Trap.....	.60
Miscellaneous Crushed Stone	
City or shipping point	Screenings, 1/4 inch down
Brooksville, Fla.—Flint.....	1.00
Fair Oaks, Calif.—Cr. Bldrs....	.85
Hendlers, Pa.—Quartzite.....	.75
Little Falls, N. Y.—Syenite....	.60
Richmond, Va.—Granite.....	1.75
Stephensburg, Ky.	1.26
Stockbridge, Ga.—Granite.....	.50
Toledo, O.—Slag.....	.75@1.25
Crushed Limestone	
City or shipping point	Screenings, 1/4 inch down
Buffalo, N. Y.	1.00, all sizes from bins.
Burlington, Vt.	2.50
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10
Grove, Md.	2.25
Hagerstown, Md.	2.00 for all sizes
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast
Quarryville, Pa.	.80
Rock Cut, N. Y.	1.20
Walford, Pa.	1.25
CENTRAL:	
Alden, Ia.	.20
Alton, Ill.	1.85
Columbia, Ill. (near E. St. L.)	1.25@1.80
Detroit, Mich.	.85@1.20
Dundas, Ont.	.65
Eden and Brillion, Wis.	.80@1.00
Elmhurst, Ill.	1.00
Ft. Wayne, Ind.	Various sizes \$1.60 per net ton
Hull, Canada.	1.20
Greencastle, Ind.	1.00@1.25
Illinois, Southern.	1.50
Lannon, Wis.	1.25
Lima, Ohio	1.00
Linwood, Scott Co., Ia.	.50
Mankato, Minn.	.70@.75
Mayville, Wis.	.70@.75
McCook, Ill.	\$1.00@1.25
Oshkosh, Wis.	1.50@1.65
Ottawa, Can.	2.00
River Rouge, Mich.	.95@1.00
Rockford, Ill.	1.25
Sherman and Hamilton, Wis.	1.00 in all sizes, Blue Limestone
Stone City, Ia.	1.90
Toledo, Ohio.	.60@1.00
Toronto, Can.	1.55
SOUTHERN:	
Brookville, Fla.	.50
Fort Springs, W. Va.	1.60
Irvington, Ky.	.75
Ladds, Ga.	2.40
Mascot, Tenn.	.75
Stephensburg, Ky.	1.20
Winnfield, La.	1.20
WESTERN:	
Atchison, Kans.	.50
Blue Sprgs. & Wymore, Neb.	.15
Carthage, Mo.	1.50
El Paso, Tex.	.60
Kansas City, Mo.	.60
Crushed Trap Rock	
City or shipping point	Screenings, 1/4 inch down
Baltimore, Md. (vicinity)—	1.25
Birdsboro, Pa.	1.25
Branford, Conn.—Trap.....	1.00
Duluth, Minn.—Trap.....	.65@.75
Glen Mills and Rock Hill, Pa.—Trap.....	1.10
Little Rock, Ark.—Trap.....	1.75
Millington, N. J.	1.85
Montrose, Ia.—Trap.....	1.10@1.20
Morristown, N. J.—Trap.....	1.85
New Britain, Conn.—Trap.....	.75
North Branford, Conn.—Trap.....	.80
Richmond, Cal.—Trap.....	.60
Westfield, Mass.—Trap.....	.60
Miscellaneous Crushed Stone	
City or shipping point	Screenings, 1/4 inch down
Brooksville, Fla.—Flint.....	1.00
Fair Oaks, Calif.—Cr. Bldrs....	.85
Hendlers, Pa.—Quartzite.....	.75
Little Falls, N. Y.—Syenite....	.60
Richmond, Va.—Granite.....	1.75
Stephensburg, Ky.	1.26
Stockbridge, Ga.—Granite.....	.50
Toledo, O.—Slag.....	.75@1.25
Crushed Limestone	
City or shipping point	Screenings, 1/4 inch down
Buffalo, N. Y.	1.00, all sizes from bins.
Burlington, Vt.	2.50
Coldwater, nr. Rochester, N. Y.	Flux, 1.50@2.10
Grove, Md.	2.25
Hagerstown, Md.	2.00 for all sizes
North Leroy and Akron, N. Y.	\$1.00 for all sizes, including R. R. ballast
Quarryville, Pa.	.80
Rock Cut, N. Y.	1.20
Walford, Pa.	1.25
CENTRAL:	
Alden, Ia.	.20
Alton, Ill.	1.85
Columbia, Ill. (near E. St. L.)	1.25@1.80
Detroit, Mich.	.85@1.20
Dundas, Ont.	.65
Eden and Brillion, Wis.	.80@1.00
Elmhurst, Ill.	1.00
Ft. Wayne, Ind.	Various sizes \$1.60 per net ton
Hull, Canada.	1.20
Greencastle, Ind.	1.00@1.25
Illinois, Southern.	1.50
Lannon, Wis.	1.25
Lima, Ohio	1.00
Linwood, Scott Co., Ia.	.50
Mankato, Minn.	.70@.75
Mayville, Wis.	.70@.75
McCook, Ill.	\$1.00@1.25
Oshkosh, Wis.	1.50@1.65
Ottawa, Can.	2.00
River Rouge, Mich.	.95@1.00
Rockford, Ill.	1.25
Sherman and Hamilton, Wis.	1.00 in all sizes, Blue Limestone
Stone City, Ia.	1.90
Toledo, Ohio.	.60@1.00
Toronto, Can.	1.55
SOUTHERN:	
Brookville, Fla.	.50
Fort Springs, W. Va.	1.60
Irvington, Ky.	.75
Ladds, Ga.	2.40
Mascot, Tenn.	.75
Stephensburg, Ky.	1.20
Winnfield, La.	1.20
WESTERN:	
Atchison, Kans.	.50
Blue Sprgs. & Wymore, Neb.	.15
Carthage, Mo.	1.50
El Paso, Tex.	.60
Kansas City, Mo.	.60
Crushed Trap Rock	
City or shipping point	Screenings, 1/4 inch down
Baltimore, Md. (vicinity)—	1.25
Birdsboro, Pa.	1.2

Agricultural Limestone Wholesale at Plant per Ton

(Continued from preceding page.)

Keystone, Ala.—(90% thru 50 mesh) Analysis, CaCO ₃ , 99.50%; MgCO ₃ , none	1.25
Mascot, Tenn.—(90% thru 50 mesh) Analysis, CaCO ₃ , 52%; MgCO ₃ , 38%	1.50@2.00
Stephensburg, Ky.—Analysis, CaCO ₃ , 98%	1.20
Winnfield, La.—(50% thru 50 mesh)	3.00
WESTERN	
Cement, Cal.—(50% thru 100 mesh)	4.00
Elsberry, Mo.—(Pulverized) Analysis, CaCO ₃ , 99.29%	1.85@1.95
Fresno, Cal.—(All thru 40 mesh) Analysis, CaCO ₃ , 98%; MgCO ₃ , 1% (50% and 40% thru 200 mesh) sacked, \$5.50; bulk, \$5.00. (100% thru 40 mesh) sacked, \$5.25; bulk	4.75
Bulk	1.50
Kansas City, Mo.—(50% thru 100 mesh)	1.50

Current Wholesale Prices in New York

CURRENT wholesale prices, prevailing on the Building Material Exchange and elsewhere in the Metropolitan district in New York, are given as below in the Record and Guide. Allowances must be made for yard and store prices:

Cement (wholesale, 1,000 bbls. lots and over, alongside dock, N. Y.):
Domestic Portland, Spot.....3.20@—
Rebate on bags, returned, 25c bag.

(Continued on page 44.)

Miscellaneous Sands per Ton at Plant

Silica sand is quoted washed, dried and screened, unless otherwise stated.

GLASS SAND:	
Bowmanstown, Pa.—Glass sand...	2.50
Cedarville, N. J.—Glass.....	1.50@4.00
Hellam, Pa.—Glass.....	2.00
Dundee, Ohio—Glass.....	2.00@2.25
Gray's Summit, Mo.—Glass.....	2.00@2.50
Kermitt, Va.—Glass sand:	
Washed.....	2.25@2.75
Crushed.....	1.75@2.00
No. 2.....	1.00@1.25
Mapleton, Pa.—Glass, damp.....	3.00
Glass, dry.....	3.50
Massillon, Ohio—Glass.....	2.00
Michigan City, Ind.—Glass sand....	.40
Mineral Ridge, O.—Glass.....	1.75@2.75
Montreal, Can.—Glass.....	4.50
Montoursville, Pa.—Glass.....	1.25@2.00
Oregon and Wedron, Ill.—Glass....	2.00@2.50
Ottawa, Ill.—Silica.....	2.00@2.50
Sands, Elk Co., Pa.—Glass sand:	
Washed, wet.....	2.50
Selected, green.....	2.50
Silica and Pacific, Mo.—Glass.....	2.00@2.50
St. Mary's, Pa.—Glass sand—Green, \$2.50; washed.....	3.00
South Vineland and Cedarville, N. J.—Glass.....	2.00
Sugar Grove, Ohio—Glass.....	2.00@2.25
Thayer, W. Va.—Glass.....	2.50@3.00

FOUNDRY SAND:

Albany, N. Y.—Moulding.....	1.50@2.00
Allentown, Pa.—Moulding.....	1.40@1.50
Bowmanstown, Pa.—Moulding.....	1.50
Cleveland, O.—Moulding.....	1.25@1.75
Cleveland, O.—Core, at pit.....	.33@.75
Fleetwood, Pa.—Silica heating.....	2.15
Mapleton, Pa.—Moulding, damp.....	3.00
Moulding, dry.....	3.50
Michigan City, Ind.—Core.....	.30
New Lexington, Stamford and Layland, Ohio—Moulding.....	2.00@2.25
Utica, Ill.—Moulding.....	.75@1.00
West Albany, N. Y.—Moulding.....	2.25@5.00
Zanesville, O.—Moulding.....	2.00@2.25

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
EASTERN:						
Bowmanstown, Pa.....		1.20	1.10			
Buffalo, N. Y.....		.85	.80	1.25 cu. yd., all sizes		
Buffalo, N. Y. (Niagara River)	1.00			.80	.80	.80
Libby's Pit, Leeds Junct., Me.	1.00	.50@.60	1.50		1.35	1.25
Morristown, N. J.....		.50@.55	.95@1.00	.95@1.00	.95@1.00	
No. Wilbraham, Mass.....		.50*	1.75*		1.20*	1.05*
Washington, D. C.....	.75	.75	2.00	1.70	1.40	1.20
Washington, D. C.—Wharves.		.75	2.00	1.40	1.20	1.20
CENTRAL:						
Algonquin, Ill.....		All grades .50 per cu. yd. (3,000 lbs.)				
Barton, Wis.....	.75	1.00	.70	.70	.70	.70
Beloit, Wis.....	.40	.40	.50	.40	.40	.40
Chicago, Ill.....		.95@1.05			.95@1.05	
Cincinnati, Ohio.....	.40@.50	.40@.50	.40@.50	.50@.60	.50@.60	.50@.60
Columbus, O.....		.60	.60	.60	.60	.60
Des Moines, Ia.....	.40@.75	.50	1.25@1.50	1.25@1.50	1.00@1.25	1.00@1.25
Des Moines, Ia.....	.30@.40	.30@.40			1.00@1.25	1.00@1.25
Elgin, Ill.....		.50	.50	.50	.50	.50
Escanaba, Mich.....	1.00	1.00	1.20	1.20	1.00	1.00
Hawarden, Ia.....	.40@.60	.40@.60		.95@1.25		.85@1.00
Greenville and Mechanicsburg, O.....	.50	.50	.60	.60	.60	.60
Illinois, Northern.....	.60@.70	.60@.70	.70@.80	.60@.70	.60@.70	.50@.60
Indianapolis, Ind.....	.50	.50		.65	.65	.65
Janesville, Wis.....		.50@.75			.50@.75	
Kalamazoo, Mich.....	.50@.60	.50@.60	.50@.70	.60@.80	.60@.80	.60@.80
Mason City, Ia.....	.60	.50	1.10@1.20	1.20	1.00@1.20	1.00@1.20
Milford, Ind.....		.60			.70	
Milwaukee, Wis.....	1.06 for all sizes					
Minneapolis, Minn.....	.50*	.50*	1.25*	1.20*	1.15*	1.10*
Montezuma, Covington, Ind..	.75	.75	.75@.85	.75	.75	.75
Niles, Mich.....		.50@.80	.60@.85	.50@.80	.50@.80	.50@.80
Sabula, Ia.....	.40@.60	.40@.60	1.00	1.00	1.00	1.00
Saginaw, Mich.....	.95	.95	1.85	1.85	1.60	1.60
St. Paul, Minn.....	.65*	.65*	1.75*	1.25	1.15*	1.15*
Summit Grove, Ind.....			.75 for all sizes			
Terre Haute, Ind.....	.75	.75	.75@.85	.75	.75	.75
Wabash Valley District, Ind..			All sizes, .75			
Winona, Minn.....	.60@.90	.60@.90	1.00@1.40	1.00@1.40	.95@1.25	.95@1.25
SOUTHERN:						
Charleston, W. Va. (River)..	1.20	1.20	1.30	1.30	1.30	1.30
Lake Weir, Fla.....	.50					
Knoxville, Tenn.....	.85@.90	.85@.90	1.00@1.50	1.00@1.50	.95@1.40	.95@1.40
New Orleans, La.....	1.70*	(2500 lbs.)	2.50*	(2700 lbs.)		
Pelzer, S. C.....		All sizes, .55 per net ton				
Valde Rouge, La.....		.75* @ 1.00*	2.10*	2.00*	1.50*	1.25*
Waco, Tex.....	.75	.75	1.20*	1.20*	1.00*	1.00*
WESTERN:						
Joplin, Mo.....	1.00	.60	.45	1.50	1.25	2.00
Kansas City, Mo.....		Car lots, building sand, @ .60; retail truck 1.50*				
Lincoln, Neb.—(Pit).....	.55	.55	1.50	1.50	1.50	1.40
Pueblo, Colo.....	.80	.60			1.50	
Roche Spur, Tulare Co., Cal..			.35 River sand 1/4 inch			
San Francisco, Cal.....			1.15 for all grades			
Seattle, Wash.....		1.00*	1.75*	1.00*	1.00*	1.00*
Vancouver, B. C. (Scows).....		1.45*	1.70*	1.65*	1.65*	1.45*

Bank Run Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, 1/4 inch and less	Gravel, 1/2 inch and less	Gravel, 1 inch and less	Gravel, 1 1/2 inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.....	.50	.50	.60			.60
Burnside, Sand Pit, Conn....		All sand, .80 cu. yd.				
Bushnell's Basin, N. Y. (near Rochester)		All sizes, .40@.50				
Lowell Junction, Mass.....		.50* @ .75*				1.25*
Pittsford, N. Y.....		.50				
Yardville, N. J.....	.50 @ .75					
York, Pa.....	1.00@1.25					
CENTRAL:						
Attica, Ind.....	.75					
Cleveland, O.....			1.00@1.75 bank sand			
Covington, Ind.....				.60	.60	
Des Moines, Ia.....			Concrete mix washed at .60 per ton			.85
Escanaba, Mich.....			Concrete mix .55			
Indianapolis, Ind.....				.50 @ .75		
Janesville, Wis.....				.50		
Milford, Ind.....				.85		
Portsmouth, Ohio.....		.65				.50 @ .70
Sabula, Ia.....						
Saginaw, Mich.—(River dock)	.50		1.20	1.20		
Summit Grove, Ind.....		.50 all sizes				
Terre Haute, Montezuma, Ind.	.50 @ .60				.60	.50 @ .60
Toledo, O.....					.55 @ 1.00	
Wabash Valley District, Ind.			.75 for all sizes			
Winona, Minn.....			Pit run gravel under 2-in., .60@.90			
SOUTHERN:						
Howcott, La.....	.75	.60	.40			.65
Joplin, Mo.....	.85 @ .90					
Knoxville, Tenn.....			.44	.44		
Lindsay, Tex.....	.65 @ .90	.65 @ .90			.85 @ 1.10	.85 @ 1.10
Memphis, Tenn.....						
Valde Rouge, La.....						
WESTERN:						
Pueblo, Colo.....			River Run .60 unscreened			
Vancouver, B. C.....		.85 @ 1.10	1.00 @ 1.25			.35 @ 1.00

* Cubic yard. B Bank. L Lake. J Ballast.

Current Wholesale Prices in New York

(Continued from page 43.)

Rosendale Natural to dealers,
wood or duck bags.....@—
Rebate on bags, returned, 10c bag.
Gravel (500 cu. yd. lots f. o. b. alongside
dock N. Y., wholesale):
1½ in. (nominal).....\$2.00@—
Other sizes, no quotations.

Sand—

Screened and washed Cow Bay.
500 cu. yds. lots, wholesale..\$1.25@—
Lime (standard 300-lb. bbls.):
Eastern common, wholesale
price\$2.50@—
Eastern finishing, wholesale
price\$2.70@—
Hydrated common (per ton)..15.20@—
Hydrated finishing (per ton)..17.20@—

Plaster—(Basic prices to dealers at yard, Manhattan):

Mason's finishing in 100 lbs.
bags, per ton.....\$23.00@—
Dry Mortar, in bags, return-
able at 30c each per ton.... 14.05@—
Block, 2 in. (solid), per sq. ft.....\$0.11
Block, 3 in. (hollow), per sq. ft.... 0.11

Crushed Stone (500 cu. yd. lots, f. o. b. alongside dock N. Y., wholesale):

Trap rock, 1½ in. (nominal)...\$1.85@—
Trap rock, ¾ in. (nominal)... 2.00@—
Crushed limestone, 1½ in..... 1.80@ 1.85
Crushed limestone, ¾ in..... 1.90@ 2.00

Building Stone—

Indiana limestone, per cu. ft.....\$1.23
Kentucky limestone, per cu. ft..... 1.50
Brier Hill sandstone, per cu. ft..... 1.50
Gray Canyon sandstone, per cu. ft... .95
Buff Wakeman, per cu. ft..... 1.50
Buff Mountain, per cu. ft..... 1.50
North River bluestone, per cu. ft..... 1.05
Seam face granite, per sq. ft..... 1.00
S. Dover marble (promiscuous mill
blocks, per cu. ft..... 2.25
White Vermont marble (sawed), New
York, per cu. ft..... 3.00

Increased Concrete Boat and Road Construction for California

SAN FRANCISCO—Early resumption of highway construction is being planned by the California State Highway Commission. Had the earlier Federal orders to the State Highway Commission been literally observed, there would have been no activities at all in construction, but in certain places where completion was vital because of the difficult detours, the commission went ahead doing the best it could with limited materials and still more limited labor. It is to rush this work through to completion that the commission is now working.

While there will not be the feverish haste displayed in the construction of ships hereafter as during the world war,

shipbuilding will continue as one of the great industries of California. This State is the birthplace of concrete shipbuilding and the construction on a large scale is predicted of ships from material which formerly was considered to be fit only for foundations for buildings or walls of structures on land.

The San Francisco Shipbuilding Co., builders of the ship "Faith" which still is demonstrating the practicability of concrete ships, has been given permission by the commissioner of corporations to sell more of its capital stock. Under this authority the company will sell 3575 shares par, \$100, the proceeds to be used in completion of concrete steamships. This issue is subject to the approval of the Federal Capital Issues Committee.

Pacific Coast Producers Optimistic

SAN FRANCISCO, Cal.—At a meeting recently held of the crushed rock, sand and gravel producers of the state in San Francisco, the views expressed were decidedly optimistic. Each one reported that much highway and street work had been proposed and that building construction would be decidedly active. Plants that had been closed during the last three or four years were considering opening again.

In the central portion of the state the building of the large naval base in Alameda will require a tremendous tonnage of rock and other materials. In this particular section, along with the shipyard activity and the construction of proposed factories, it is apparent that the industry will be quite active for several years to come.

There is, however, a demand for a high type of crushed rock. Engineers generally are demanding a better concrete aggregate than heretofore for all building construction of the future. Prices naturally are high and the demand will be for high class material.

Now that the ban is removed, so that large building structures can be undertaken, much more activity will be shown.

Harbor improvements on the San Francisco waterfront are contemplated that will also require a large quantity of concrete and other material.

Prices Will Remain at Present Plane

INDICATIONS ARE that prices will not materially lower, if at all during the next year. In fact, there are indications of the continuance of the present plane and in some cases an upward tendency. Lowering of wages seems improbable. To many, to attempt to force the lowering of wages will tend to breed trouble that will not help the general situation or the condition of the country at all.

It is reported by Dow that in New York last week the Building Trades Employers'

Association adopted a resolution to the effect that "all trade agreements expiring at the end of the year 1918 may be renewed for a time not exceeding one year, and that trade associations shall not agree to pay a wage in excess of that now being paid, as set forth in the schedule in any new agreement made for the year 1919."

Meetings of similar nature are said to be planned in other large centers like Philadelphia and Boston, Buffalo and Chicago. At these meetings similar resolutions will doubtless be proposed and adopted. The get-together spirit on the labor question is noted as very pressing among business men.

The window glass situation is typical of practically every other basic building commodity at present. Stocks were never so low. Jobbers' stocks are sufficient for any moderate demand, but since manufacturing interests had laid their plans for a very much restricted output during the season just starting, it will be impossible for them to produce glass in the quantities that probably will be called for. Therefore, the strain upon current jobbers' stocks is beginning to be felt.

Government Prices for Sand, Gravel and Stone

THE PRICE-FIXING COMMITTEE of the War Industries Board authorizes the following:

At a meeting of the Price-Fixing Committee held on Thursday, Oct. 31, the following maximum prices were fixed to cover purchases, whether by the Government or otherwise, and to be effective for the period ending Feb. 28, 1919, for the Norfolk district, i. e., the State of Virginia, south of and including Petersburg, and the States of North Carolina and South Carolina:

For deliveries in full barge lots f. o. b. point of origin or f. o. b. car plant, per ton of 2,000 pounds net: Sand, \$0.50 per ton; gravel, \$0.95 per ton; crushed stone, \$1.30 per ton; crushed granite, \$1.75 per ton—not including railroad ballast or screenings.

Belief Houston's Visit Means U. S. Road System

WASHINGTON, D. C.—Secretary Houston's advocacy of good roads is deemed of great importance because of the coming convention of the Highway Industries Association in Chicago, December 11 and 12, at which will be gathered public officials, leaders in industry and many scientists and educators interested in the highways of the country.

That Secretary Houston, in addressing the agricultural editors of the country at their meeting the past week, after consultation with President Wilson and the other constituted authorities, is clearly foreshadowing the initiation of a National Highway System is the belief here.



Passed By The Screens



Incorporations

Valley Sand & Supply Co., Parnassus, Pa.; \$99,000. J. K. Watson.

Limestone Quarries Co., Delphos, Ohio; \$25,000. M. Clippinger, K. Werline, E. L. France, W. T. Robinson, W. R. France.

Arkansas Gravel Co., Greenville; capital, \$100,000. Incorporators: F. D. Coppock, H. R. Brown, Guy; C. Baker, Joe F. Coppock and M. A. Neville.

Auto Gas and Supply Co., Winona, Minn. The general nature of its business "shall be to locate, purchase, lease or otherwise acquire lands, quarries of all kinds."

Cambridge Sand & Gravel Co., Boston, Mass.; \$50,000. Directors: Thos. W. Hodgkiss, 67A School St., Everett, pres. and treas.; Willis N. Tuller and Jas. B. Vallyely.

Crotch Island Granite Corp., Knox, Rockland, Me.; granite business, real estate and deal in all kinds of merchandise; \$100,000. Pres. and clerk, A. S. Littlefield; treas., Margaret L. Simmons.

Potash Quarry Co., Pierre, S. D., and Minneapolis, Minn., \$100,000. To quarry, mine, crush, etc., alunite and other minerals. Geo. T. Simpson and R. C. Russell, Minneapolis, Minn.; James Seebree, Pierre, S. D.

Aroostook Lime Co., Aroostook, Caribou, Me.; real estate, quarry, burn, crush, etc., lime, rock; deal in general merchandise, for fertilizers, cement, etc.; \$50,000. Pres., O. L. Keyes; treas., L. J. Pendell; clerk, Joseph E. Hall.

Application has been made to the governor of Pennsylvania by George L. Brown, John R. Foster and J. Howard Meyers for a charter for the Vulcan Lime and Stone Co. Solicitors are James F. Burke and Wm. J. Levy, Farmers' Bank Bldg., Pittsburgh, Pa.

A charter exceedingly broad in scope has just been granted by Delaware to the American Potash & Nitrate Corporation, a concern which will develop an industry of considerable magnitude in South America. It will engage primarily in the manufacture and refining of potash and its by-products for shipment to the United States and other parts of the world, obtaining its crude material from selected areas in the southern hemisphere. The corporation's temporary headquarters are to be at No. 26 Beaver St.

Personals

Richard K. Meade & Co., chemical and industrial engineers, announce the removal of their offices and laboratories to the Macht building, 11-13 E. Fayette St., Baltimore, Md.

Frank Jones, general manager of the Canada Cement Co. and vice-chairman of the Canadian War Trade Board, will be one of the party accompanying Sir Robert Borden, premier of Canada, to England to attend the preliminary peace conference.

Preston K. Yates, consulting engineer and specialist on stone-crushing and sand and gravel plants, has been retained by the Knoxville Power Co. to design a large crushing plant at Alcoa, Tenn. This plant will furnish crushed stone for a large dam to be erected there. The initial crusher will be large size Edison rolls. Mr. Yates is also consulting engineer for the Air Nitrates Corporation on its crushing plant at Mussels Shoal, Ala.

E. Mavant, formerly of the Public Works Department at Ottawa, Ont., joined the staff of engineers of the Milton Hersey Co., Ltd., Montreal, to take full charge of their cement, sand and stone testing laboratories as director. Mr. Mavant for three years tested building and structural materials for the Department of Public Works at Ottawa, after which he became assistant director and acted in that capacity for nine years. In 1916 he joined the Canadian Inspection and Testing Laboratories at Montreal as director of their cement laboratories.

Potash

The New Ellen Potash & Chemical Co., Van Nuys Building, Los Angeles, Cal., has had preliminary plans prepared for the construction of a new plant in the vicinity of Los Angeles, consisting of a main three-story, reinforced concrete building. Hugh H. Newell heads the company.

Among the Canadian visitors at the chemical exposition in New York recently was Dr. A. W. G. Wilson of the Canadian Bureau of Mines, on a special mission from the Dominion Government to study the precipitation of potash in cement mills. If this process can be successfully applied in Canada, it is stated that one of the Canadian mills will be able to turn out as much as 4,000 tons of potash annually.

The Insular Potash Co. of Port Townsend, Washington, recently incorporated, has reached a plant capacity of six tons of potash a week. The company is now building another incinerator which will double the output. The plant is located on Decatur Island, Washington, while the office is at 236 Taylor St., Port Townsend, Wash. President, W. J. Hewitt; vice-president, F. U. Smith; secretary and general manager, F. O. Meeker.

Bert Schlesinger and W. W. Chapin returned to San Francisco from Boston, where they announce they succeeded in organizing the General Bond & Share Company, capitalized at \$10,000,000. This concern is said to have taken over the Chapin Chemical Company, of which Chapin is listed as president and Schlesinger as secretary. It is announced that Chapin and F. M. Smith were recently granted a lease on 1,200 acres of land in the Searles lake potash district and that with the floating of their securities a big refinery will be established on the property.

Sand and Gravel

Lake County Gravel Co., Chicago, has dissolved.

The Forestport Sand & Gravel Co., Forestport, N. Y., have shut down operations for the winter. The plant will resume operations May 1, 1919.

Plans formulated by the creditors' committee of the John B. Rose Co. and the Rose Brick Co., of Newburgh, N. Y., for reorganization call for the forming of two companies, one to be known as the Marlborough Sand and Gravel Co., and the other to be known as the Roseton Brick Works, Inc., to take over the Rose Brick Co. The creditors are asked to take a series of notes. The stock incorporation is to be put in the hands of a voting trust which will manage the business, but will not have the power to mortgage the property without the consent of two-thirds of the stockholders. The plan awaits the approval of the creditors.

Manufacturers

The Walter A. Zelnicker Supply Co., St. Louis, announces the appointment of Joseph Meyerson as secretary to the president.

Mr. Meyerson was associated for ten years with the Southwestern Tariff Bureau. Mr. Kottsieper has recently joined the traveling force of the company and will make southwestern territory. For many years Mr. Kottsieper traveled for the St. Louis Screw Co., prior to which time he was connected with the E. H. Linley Supply Co., and Western Iron and Supply Co.

Phosphate

On Canyon Creek, Montana, the Anaconda Company has completed the patenting of two claims through which a bed of phosphate rock, carrying 30 per cent phosphoric acid, has been struck.

Cement

Cement plants in the Lehigh Valley section of Pennsylvania are planning for the early resumption of activities on the almost normal plane (75 to 85 per cent fuel consumption).

The Edison Portland Cement Co., New Village, N. J., has decided to discontinue farming operations in connection with its corporation activities, and has held a record sale of cattle for this section. The 1,000 acres of land will be leased.

Fire recently in the roaster building and coal mill of the Copley Cement Co., Copley, Pa., in plant known as Mill B, caused considerable damage. It is understood that the section of the works will be immediately rebuilt.

Guy W. Mallon, receiver of the Superior Portland Cement Co., Cleveland, O., has filed a report of receipts and expenditures from Nov. 2, 1917, to Nov. 7, 1918, showing disbursements of \$149,392.83 and receipts of \$165,162.84.

The San Joaquin Portland Cement Co., Porterville, Cal., has inaugurated survey and excavation work for its proposed new cement works near Worth. The new plant will have an initial capacity of about 350,000 barrels a year and is estimated to cost \$600,000, with machinery and equipment. W. J. Dingee heads the company.

The California Cement Co., operating one of the largest cement plants in the southwest at Colton, Cal., about 60 miles from Los Angeles, is planning to resume operations at the mill early in January. Owing to the restrictions of the War Industries Board, now removed, the company suspended work in October, its supply of fuel oil and electric energy, as allowed, having been utilized. T. J. Fleming is secretary and general manager.

The plant of the Buffalo Potash & Cement Corporation, Katherine and Ensign streets, Buffalo, will be sold at an early date by Dennis J. McCarthy, trustee in bankruptcy. The sale will include the plant and equipment, including machinery and tools, with electrical apparatus, metallurgical furnace, power plant, crane and miscellaneous equipment. The property embraces a quantity of limestone, feldspar, magnesium sulphate and magnesite brick.

Quarries

Batchelder Marble Co., Detroit, Mich., has increased its capital stock from \$50,000 to \$150,000.

The Rockas Products Co., Pittsburgh, Pa., has acquired property, about 129x2,000 ft., on the back channel, Neville Island, for a consideration of \$14,000.

The Farman interest in the Portageville (N. Y.) Blue Stone Co. has been purchased by P. C. Foley of Olean, N. Y., and the business office will be with Foley Bros. Co. in that city.

A plant for the treatment of feldspar tailings will be erected at Craigmont, Ont., by the Conlajas Mines, Ltd., St. Catharines. Equipment will include crushing machinery, power machinery, transmission material, etc.

At a conference of North Wales (Pa.) quarry owners and representatives of the Quarrymen's Union a substantial increase in the wages of the men was agreed to, subject to confirmation by the respective parties. It has been brought about without threats of strikes, petulance or violence on the part of the men.

The Gold Hill fertilizer works, Gold Hill, Ore., has completed the erection of its new limestone plant. It is expected to place the plant in operation at an early date for the production of high-grade fertilizers, the initial works having a capacity of about 200 tons of limestone. Owing to the difficulty of securing the necessary machinery, the progress in erection had been slow.



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STEAM SHOVEL THEW, Type 1

On Traction Wheels. Working Weight 30 tons. Perfect Working Order. Immediate Delivery.

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Have sold four carloads this season and have on hand 40,000 feet in various sizes and lengths, 6x7 and 6x19 construction, all carefully selected, 90% efficiency.

Will ship subject to inspection

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JAW CRUSHER — large size

Give price and full particulars

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FOR SALE (Good as New)

1—Farrell 20 in. Crusher
1—80 Mesh 20 Ton Kent Pulverizer
1—Double Roll Back Geared Pulverizer
Will be sold cheap if moved quickly.

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Orangeville, Columbia County, Pa.**

LIMESTONE SCALES

Capacity 300,000 lbs. per hour. Richardson automatic bulk new. ROTARY KILN, 5' x 60'. ROTARY COOLER, 36" x 30'. GAS PRODUCER, motors, blowers, etc. All used three months.

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Dealers in "Used" but "Not Abused" Machinery

FOR SALE

45—2 yd. end dump, Austin type cars, 3 ft. gauge, steel bodies. In good operating condition.
18—1 and 1 1/4 yd. Koppie type, double side steel dump cars, 24" gauge.
1—Davenport locomotive, 9x14, 3 ft. gauge—cheap.

**PRINCE-JOHNSON LIMESTONE COMPANY
615 American Bank Bldg. Kansas City, Mo.**

FOR SALE

Used steam drill and six brand new End Dump Steel Quarry Cars, two yard capacity, equipped to handle from either end or side. Manufactured by Austin Manufacturing Co.

**THE SHERMAN NURSERY COMPANY,
Charles City, Iowa.**

GYRATORY CRUSHERS

1 Gates No. 12 3 Number 5 1 Kennedy 10
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Locomotives, Cars,
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Must be of late make and in good condition.

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in first class condition

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Stone Crusher, Ledyard, 300 ft. Shafting, Pulleys, Concrete Power (Simplex) Mixing Machine, 400 ft. new 3/8 in. Plow Steel Cable.

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FOR SALE OR LEASE: Crushed stone quarry situated near Wilkes-Barre, Pa. Very hard green sandstone, practically equal to trap rock for road material. Quarry equipped to produce five to six hundred tons per day—has frequently run eight hundred. Ample rail facilities and an extensive market. For detailed information communicate with Arthur L. Stull, 182 S. Franklin St., Wilkes-Barre, Pa.

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In Central New York

Exceptional production facilities and quality of stone for fluxing and commercial purposes. Market for entire production. Labor and Material guaranteed. Address

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FOR SALE—Limestone crushing plant with 5 lime kilns. Forty acres stone land. Eastern part of Indiana. Details furnished. Address Box 1264, care ROCK PRODUCTS.

Help Wanted

WANTED—Purchasing Agent by large Cement Manufacturing Company. None but qualified, A-1 man who can and will make good need apply. Give references and state salary expected. Address Box 1279, care of ROCK PRODUCTS.

WANTED—First-class quarry superintendent to handle large quarry with crushing plant in southern Ohio. Position open February 1st. Only first-class men need apply. References required; past ability. Address Box 348, Huntington, W. Va.

WANTED—Quarry Supt. for Crushed Stone Plant, Anna, Ill. One No. 5 and one No. 7½ Austin Crushers, all electrically operated. Pulverator. State experience and salary expected and when available. Address C. I. P. S. Co., Mattoon, Ill.

WANTED—Superintendent or assistant superintendent who has had cement mill and quarry experience, to take charge of a large lime and stone crushing plant. Must be a hustler and good practical man, able to handle several hundred men. Splendid opening for the right man, with an excellent future. Man with cement mill experience preferred. State fully previous experience, reason for desiring change, and salary expected. Apply Box 1282, care Rock Products.

WANTED—Superintendent at a large Ohio quarry producing 2,500 tons crushed stone daily with capacity for considerably more. Responsible man of executive ability and large experience to take entire charge of plant. All year proposition. High-class responsible company. Address Box 1283, care Rock Products.

WANTED: General Supt. for large crushing plant who has had considerable experience in handling of quarry works, steam shovels, locomotives and crushing machinery as well as to handle plant office and men. Position permanent at satisfactory salary. Address full particulars to Box 1284, care ROCK PRODUCTS.



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FIVE PLANTS: ALPENA, DETROIT, WYANDOTTE, CLEVELAND AND DULUTH

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CEMENT MANUFACTURING PLANTS
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PULVERIZED COAL INSTALLATIONS
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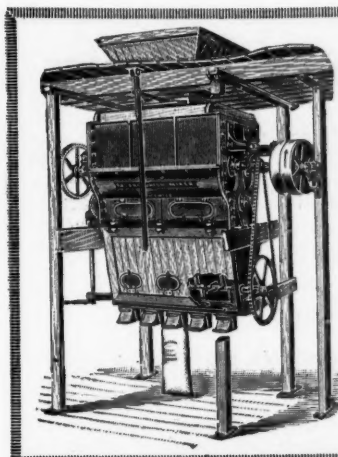
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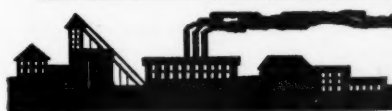


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Is continuous in operation, and will thoroughly mix any dry materials as fast as two men can bag and remove.

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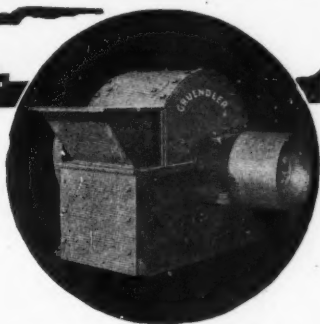
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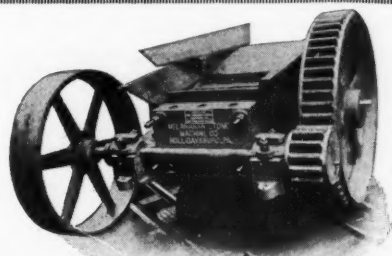
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A most efficient machine for large production, small power consumption and BIG PROFITS.

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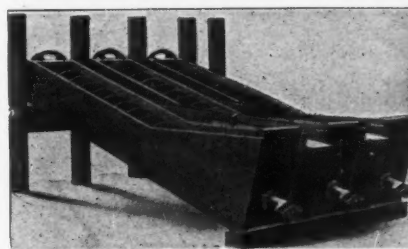
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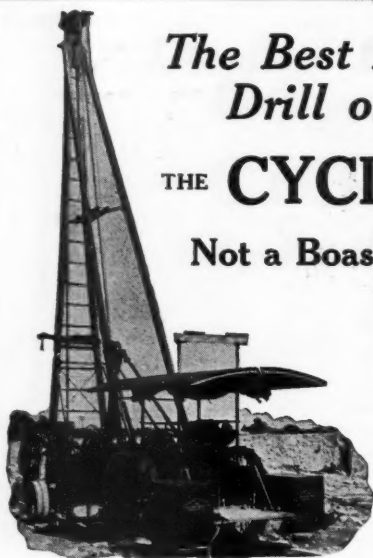
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To Determine Carbonates —a New Method

The percentage of carbonates in limestone, fertilizers, baking powders and other materials can be determined **AC-CURATELY** and **QUICKLY** with the

Barker Carbonate Apparatus

Any unskilled user can obtain results by this method that compare favorably with those of a skilled chemist using standard laboratory methods.

Apparatus is a hydrometer containing the sample, to which HCL is added. Decrease in weight accompanying consequent release of CO₂ is recorded on a scale as "percentage of carbonates" from which the gas escaped. No chemical balance required, and no long calculations to be made.

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Experienced in designing and manufacturing Rotary Kilns for calcining of Lime, Cement, Dolomite, Magnesite, etc., together with their auxiliary equipment of Dryers and Coolers.

Drying installations for sand, all grades of rock, silica, and other materials requiring special treatment.

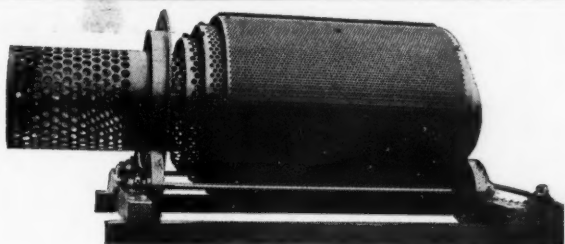
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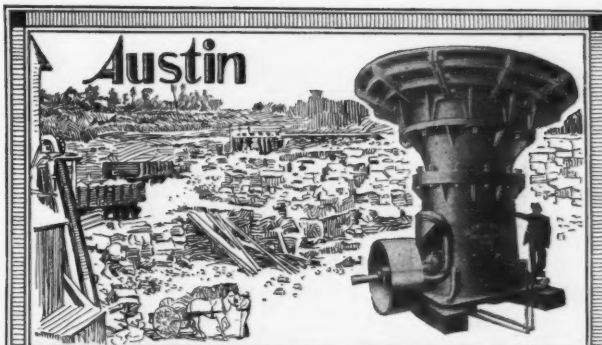
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Some Austin Gyratory Crushers are Giants in size—all are Giants in service.

Large capacity—full capacity steadily, if desired—is assured by preserving the full original stroke of the crushing head. Size of product can be changed quickly.

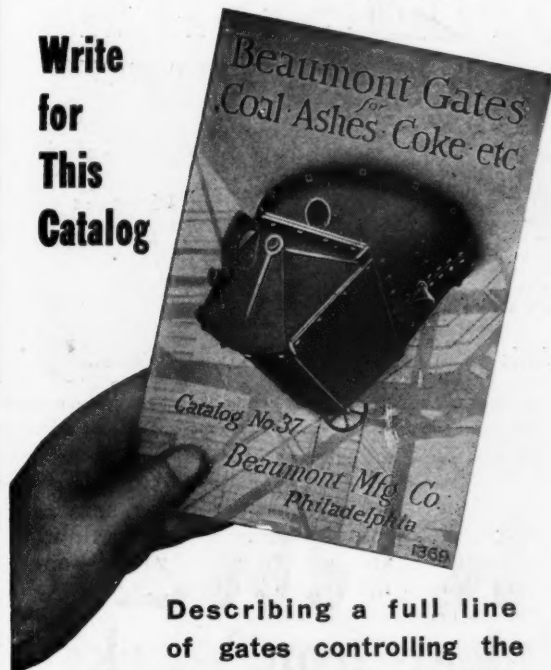
Built in 8 sizes, there is an Austin Gyratory Rock Crusher for every requirement. 50 to 5,000 tons daily capacity. Stationary and Portable types.

Write for Catalog telling all about these Crushers, auxiliary rock handling equipment, and expert engineering service.

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Catalog

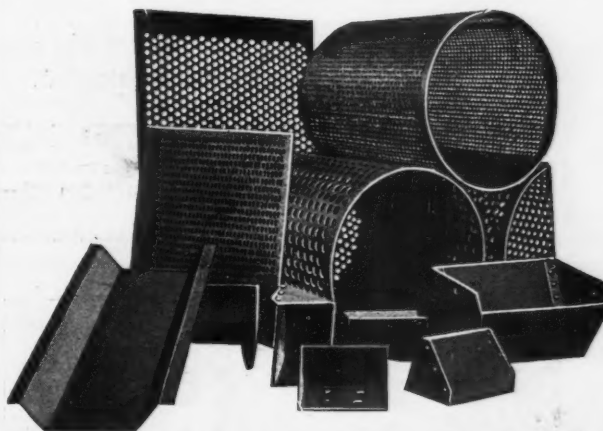


Describing a full line
of gates controlling the
flow of granular materials

BEAUMONT MFG. CO.

326 Arch Street, Philadelphia
New York: 50 Church St Boston: 141 Milk St.

Perforated Metal Screens FOR Stone, Gravel, Sand, Etc.



ELEVATOR BUCKETS

PLAIN AND PERFORATED

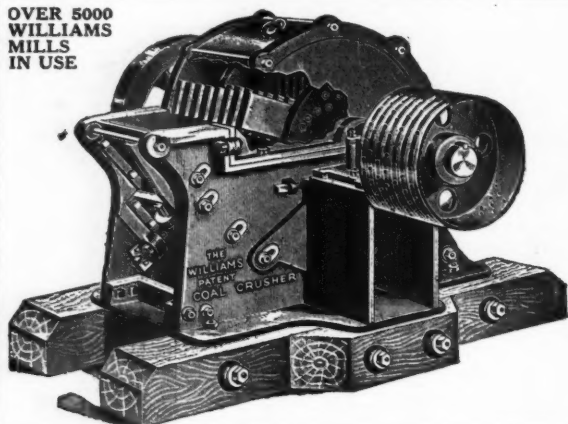
General Sheet and Light Structural Work

HENDRICK MFG. CO.
CARBONDALE, PA.

New York Office, 30 Church Street

It gets immediate attention if you mention ROCK PRODUCTS.

OVER 5000
WILLIAMS
MILLS
IN USE



WILLIAMS LUMP LIME CRUSHERS

Williams Lump Lime Crushers will take in lime in cubes 10", 12", 14", etc., and in one operation reduce same to 1/4", 1/8" or finer, as the case may be. Williams Lime Crushers are made in sizes ranging from a few hundred pounds up to 20 to 30 tons per hour, are therefore adapted to most any size plant. Parties considering installing Lime crushers to make either agricultural or hydrated lime, should investigate Williams Crushers, and secure Bulletin No. 4.

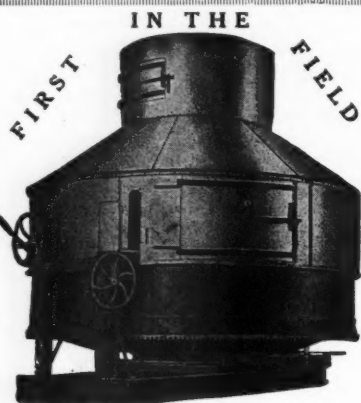
THE WILLIAMS PAT. CRUSHER & PULVERIZER CO.

General Sales Dept., 37 West Van Buren Street

Plant:
ST. LOUIS

CHICAGO

67 Second St.
SAN FRANCISCO



CLYDE HYDRATOR WITH HOOD
"The common sense way"

The CLYDE LIME HYDRATOR

The simplest and easiest to operate. The most economical in Installation, Maintenance and Operation. Makes a perfect hydrate of either High Calcium or Dolomite Lime.

Price, per ton capacity, only three-fifths of any other Hydrator on the market.

WRITE FOR CATALOG AND INFORMATION.

H. MISCAMPBELL, Duluth, Minn.

Patentee and Sole Manufacturer.

"LOPULCO" PULVERIZED FUEL SYSTEMS

Eliminate standby losses, arduous fire room labor, and immediately answer sudden calls for maximum power output.

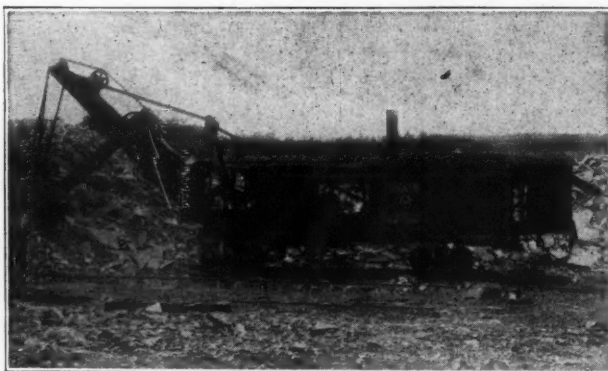
We deliver "Lopulco" equipment in operation. Call on our Engineering Department.

LOCOMOTIVE PULVERIZED FUEL COMPANY

Industrial Department

Transportation Building, Montreal

30 Church St., New York



Osgood-73, in Heavy Quarry Work

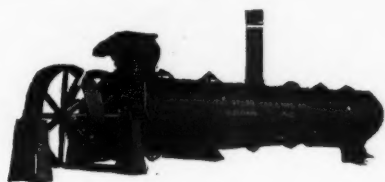
THE OSGOOD 73—3 1/2 yard steam shovel is designed throughout for the heaviest kind of service. It meets demands where maximum strength is required and severe work to be done, such as found in iron mines, rock works, etc.

It has all the features in good steam shovel construction which embody steel gears with machine cut teeth; manganese racks and pinions for dipper handle; cast steel swinging circle; heavy front end construction; especially strong boom; large boiler and water tanks; long car frame; enclosed firing platform; steam hoisting friction; by-pass throttle, etc.

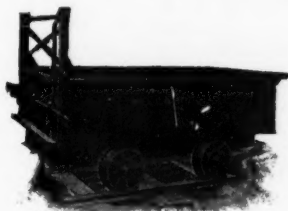
We will take pleasure in furnishing you on request complete information on any of the different size shovels we build which range from 3/4 to 6 cubic yard capacity.

THE OSGOOD COMPANY, Marion, O.

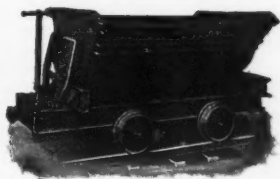
Prompt attention will be given your inquiry if you mention **ROCK PRODUCTS**.



Lime Hydrators, Kilns, Calcining and Quarry Cars



No. 274
End Dump Quarry Car.

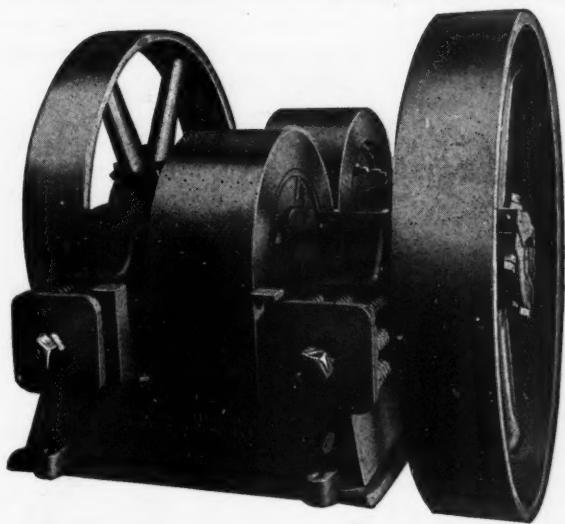


No. 217-H Rocker Side Dump Car
Also made in end dump. Above
car made for loading with
Steam Shovel.

Reduce Your Handling Costs by Using Atlas Cars and Locomotives

Where a trolley wire or third rail is undesirable investigate our storage battery locomotives. Made in several styles and sizes. Cars to suit every requirement.

THE ATLAS CAR & MFG. COMPANY
909 Marquette Road, Dept. 6, CLEVELAND, OHIO



Time and Performance

have proved the merit and durability of these crushing rolls. Their rugged construction and efficiency in quickly crushing either wet or dry ore, means long years of dependable service with extremely low repair costs.

Ask for descriptive booklet today

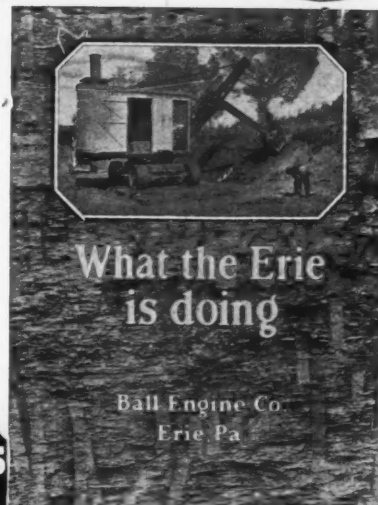
**WEBB CITY AND CARTERVILLE
FOUNDRY AND MACHINE WORKS**
WEBB CITY, MO.

ERIE

Revolving
Shovels



The cover of this bulletin, in color, shows stiff blue shale excavated by an ERIE shovel without blasting. Actual size of bulletin, 8½x11 inches. Contains practical information about excavation by steam shovel—which is often the most economical means of excavating rock or gravel.



It tells
you what a
steam shovel
can do

Fill in and mail this coupon and a copy of the bulletin will be sent to you promptly.

BALL ENGINE COMPANY, ERIE, PA.

Gentlemen: I have read the advertisement in Rock Products. Please send a copy of the bulletin on Steam Shovel Work, "What the Erie Is Doing." (No obligation on my part.)

Name

Address

UNIVERSAL CRUSHERS

The biggest value for your money. Universal crushers and pulverizers reduce stone to desired size or fineness in a jiffy! Fifteen years of designing and building experience have made possible the exceptional ability of Universals.

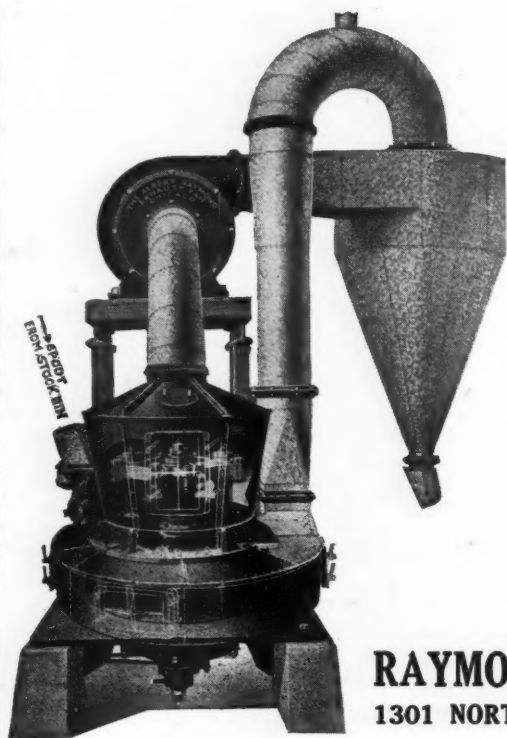
Universal Crusher Co.
225 Third Street
Cedar Rapids, Iowa, U.S.A.



Ask
for
Folder
1918

Tell the advertiser you saw his ad in ROCK PRODUCTS. He'll appreciate it.

One of the Specialties of the Raymond ^{PULVERIZING} _{Air-Separating} System



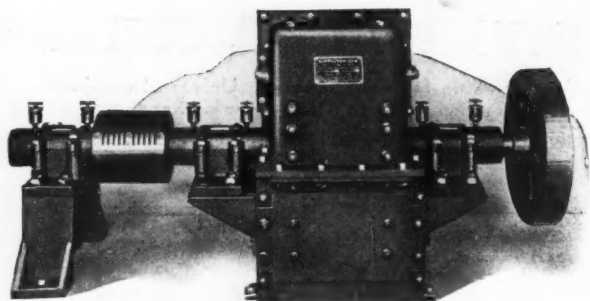
is the pulverizing of coal for use as a fuel in all kinds of Metallurgical Furnaces, including cement kilns, heat treating furnaces, for iron and steel, and melting furnaces for steel, copper, lead and zinc.

Raymond Roller Mills are today grinding more than 800 tons per hour of coal or over 16,000 tons per day of 20 hours. All of this coal is being ground to at least a fineness of 95% passing a 100 mesh test sieve and approximately 20% is ground to 92% passing a 200 mesh test sieve.

Raymond Roller Mills equipped with Air-Separation grind coal uniformly fine, producing a powder which has a constant fineness and which produces a flame very like gas or fuel oil, giving the maximum heating results. They are complete units which are dustless in operation, and which give you a clean, sanitary plant for your workmen.

Our new No. 13 catalog, just off the press, gives a full description of the system.

RAYMOND BROS. IMPACT PULVERIZER COMPANY
1301 NORTH BRANCH STREET, CHICAGO, ILLINOIS



Make Agricultural Lime and Limestone The Government is urging the use of Agricultural Lime by Farmers and such shipments are exempt from embargoes.

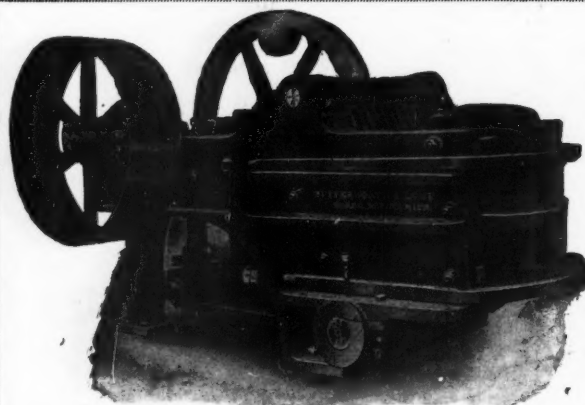
You Want the K-B Pulverizer

Because its rugged all-steel construction withstands the most severe service.

Its manganese steel linings protect all parts from wear. Its adjustable U-Type manganese steel hammers insure a uniform product, with high capacity— and low power consumption.

Send for Catalog with full particulars.

K-B PULVERIZER COMPANY, Inc., 86 Worth St. NEW YORK



Nippers—17 x 19", 18 x 26", 20 x 30", 24 x 36" and 28 x 42"

JAW & ROTARY CRUSHERS

FOR ALL ROCKS AND ORES
SOFTER THAN GRANITE

GYPSUM MACHINERY—We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe
17 Huron Street, Grand Rapids, Mich.



20" to 47" inside diameter. Many variations.

When answering ads please give credit to ROCK PRODUCTS.

WORTHINGTON

*Keeping ahead
of the country.*



“NOTHING succeeds like success”—this is in brief the story behind each of the plants grouped under the Worthington name.

For each has, through many years, held its own high place in the esteem of American industry; indeed each was called into being by some vital need of industry, and you will find our products in the service of countless important branches of the country's production.

And because our products are such necessary partners in so many and so varied interests, our growth has fairly paralleled the nation's industrial development. From modest beginnings to eight great plants, each both pioneer and leader in its field, each under a common name preserving past traditions of service and satisfaction—this is the concrete measure of Worthington success, and a hint as well of the even larger part to be played in the future.

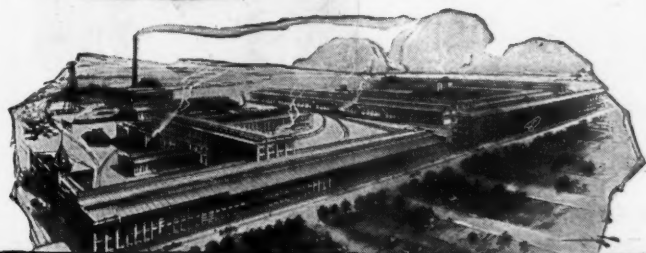
WORKS

Worthington
Works
Harrison, N. J.
Blake-Knowles
Works
E. Cambridge, Mass.
Power & Mining
Machinery Works
Cudahy, Wis.
Ingeco Engine
Works
Cudahy, Wis.
Deane Works
Holyoke, Mass.
Laidlaw Works
Elmwood Place
Cincinnati, O.
Snow-Holly Works
Buffalo, N. Y.
Hazleton Works
Hazleton, Pa.

Worthington Pump and Machinery Corporation

115 Broadway
New York City

Branch Offices in
24 Large Cities



LARGEST MAKERS OF PUMPING AND MINING MACHINERY

BRADLEY

THREE ROLL MILL



YOUR best opportunity to increase the products of the land by providing agricultural limestone is obtained by installing the BRADLEY THREE-ROLL MILL, which produces a perfect limestone powder **most economically**. It takes $\frac{3}{4}$ inch material (or smaller) and reduces it to a uniform, finely ground material in one operation. This result is accomplished at a **lower price** than is obtained by many mills which turn out **coarser** material.

*We will send full particulars and prices.
Our engineers are at your service.
Engineering of Agricultural Limestone
Plants a Specialty*

BRADLEY PULVERIZER CO.

BOSTON LONDON, ENGLAND
Works: ALLENTOWN, PA.

Cooperation is the thing—please mention ROCK PRODUCTS.

"S-A" Belt Conveyors in Cement Plants

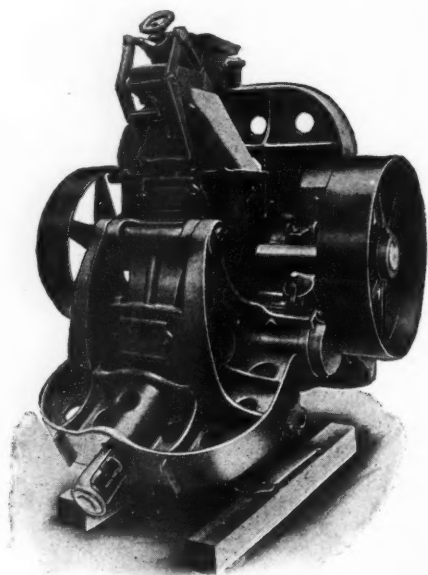
The illustration shows a part of the very extensive system of "S-A" Belt Conveyors used in the various mills of the Canada Cement Co., totaling a capacity of 20,000 barrels per day.

This 36-inch "S-A" Belt Conveyor is 260 feet between centers. It delivers ground clinker to barges for transportation to another plant. This standard type of carrier is used in all the mills of this company.

Write for the "S-A" Catalog showing complete conveying, screening and transmission equipment for cement plants and all industrial purposes.

**Stephens-Adamson
Manufacturing Co.**

*Conveying, Screening,
and
Transmission Machinery*
Aurora, Illinois
Branch Offices in Principal Cities



MAXECON MILL Preliminary Grinder for Tube Mills

LIMESTONE20 to 40 Mesh
CEMENT CLINKER.....20 to 60 Mesh

MAXECON MILL PERFECTION SEPARATOR

The UNIT that has LARGER
OUTPUT with LESS POWER
WEAR and ATTENTION than
any other.

It will be to the interest of those who operate CEMENT
PLANTS to know what the Maxecon Unit will do.

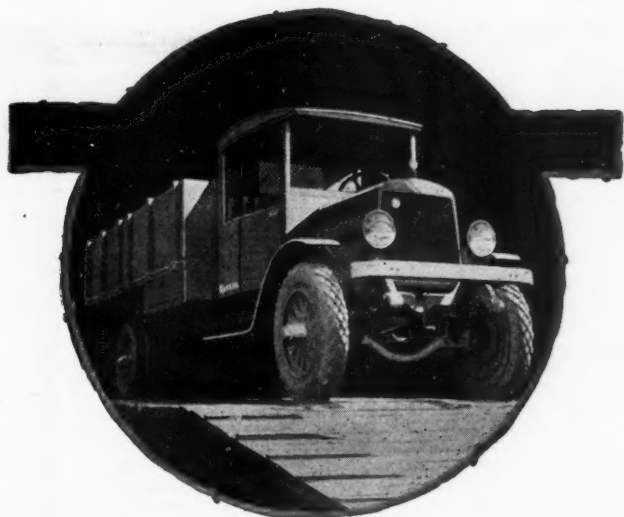
Drop us a line.

We will be glad to tell you about it.

KENT MILL COMPANY
10 Rapelyea Street BROOKLYN, N. Y.



Saying "I saw it in ROCK PRODUCTS" will bring quick action.



Never before has the need of dependability and adaptability in motor trucks been so apparent in the rock products industry as today.

KISSEL, realizing this, has incorporated in the vital structural parts of Kissel Trucks those engineering principles and construction features which ten years of motor truck designing and constructing experience have proven to produce unlimited power, ability for continuous service and low operating cost and upkeep.

The ALL-YEAR Cab, an exclusive Kissel Truck feature, insures uninterrupted performance, no matter how severe the weather may be. *In summer, it is an open, cool cab; in winter, it is completely enclosed, increasing the driver's efficiency, by giving him complete protection.*

There is the right size truck for your requirements. See your nearest Kissel Dealer, who has specifications, prices, etc. See him without delay.

KISSEL MOTOR CAR CO., Hartford, Wis., U. S. A.

**KISSEL
TRUCKS**

WEBSTER

Machinery for Conveying,
Elevating, Screening, Washing,
Storage & Power Transmission



THE operator who is not satisfied with average profits but who wants ALL that his plant will yield,—that man is going to investigate Webster Machinery.

Because Webster Machinery pays and is dependable.

Furthermore the Webster engineering staff is highly regarded for the value and practicality of their suggestions.

In product, in ideas, in methods, the name "WEBSTER" may be relied upon completely.

Catalog and engineering suggestions upon request.

**The Webster Mfg.
Company**

Tiffin, Ohio

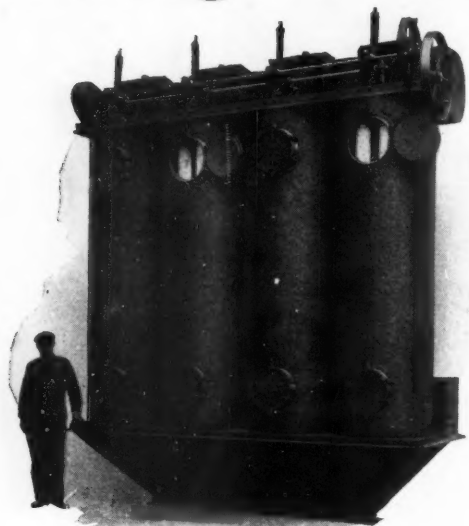
New York

Chicago

(247)

For better service say "I saw it in ROCK PRODUCTS."

Safeguard Men & Machinery



PATENTED.

ALLIS-CHALMERS

Milwaukee, Wis. U.S.A.

Keep your workmen satisfied with working conditions and reduce maintenance costs of your machinery by using an

ALLIS-CHALMERS DUST COLLECTOR

Its operation is effective and simple. The collection of dust is accomplished by filtering the air or fumes through cloth bags of special weave which are automatically cleaned at definite intervals discharging the residue into a hopper at the bottom of the machine.

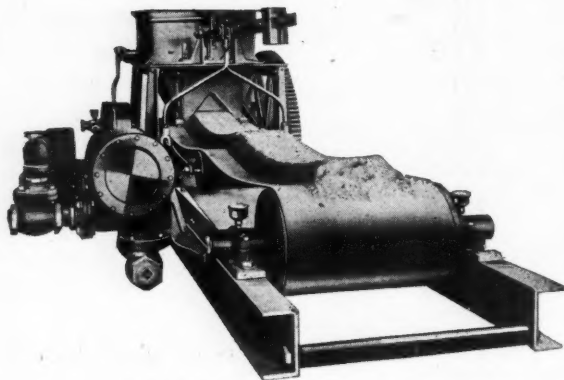
Write for Bulletin 1454F

Our Name Is Your Assurance

Sales Offices in All Principal Cities



The Schaffer POIDOMETER



IN these days of labor scarcity and high prices, it is of utmost importance to obtain the maximum results with the minimum of hands.

The Schaffer Poidometer works automatically with clock-work accuracy, delivering the desired number of pounds of material per minute, per hour, per day.

Send for our interesting literature about this wonderful labor-saving device.

Schaffer Engineering & Equipment Company
TIFFIN, OHIO

To say you saw the ad in ROCK PRODUCTS gives tone to your inquiry.

Wherever Fuse is Used

whether it be for the great record-breaking 180,000 ton blast made early this Spring by the Bethlehem Mines Corporation, or for the every day affairs,

CORDEAU-BICKFORD FUSE

becomes the choice for efficient, sure results. It adds 10 to 20 per cent to the efficiency of explosions—can be set for discharge at one time, in groups or seriatim.

Not sensitive to shock or friction—it's safe

THE ENSIGN-BICKFORD CO.

SIMSBURY, CONN.

*The Original
manufacturers of
Safety Fuse*

**ESTABLISHED
1836**



Turn Night Into Day

by using a

NEW MILBURN Portable Carbide Light

*The kind that burns ordinary
carbide that's sold everywhere.*

Mines equipped with New Milburns are independent of dark days—independent even of nightfall—for the wonderful New Milburn Lights, with capacity up to 25,000 candle power, give a powerful illumination that turns night into day.

*They cost from 1c. to 4c. an hour, depending on
candle power.*

*They operate absolutely automatically and require
no attention.*

*They don't overgenerate—and you CAN'T over-
charge them.*

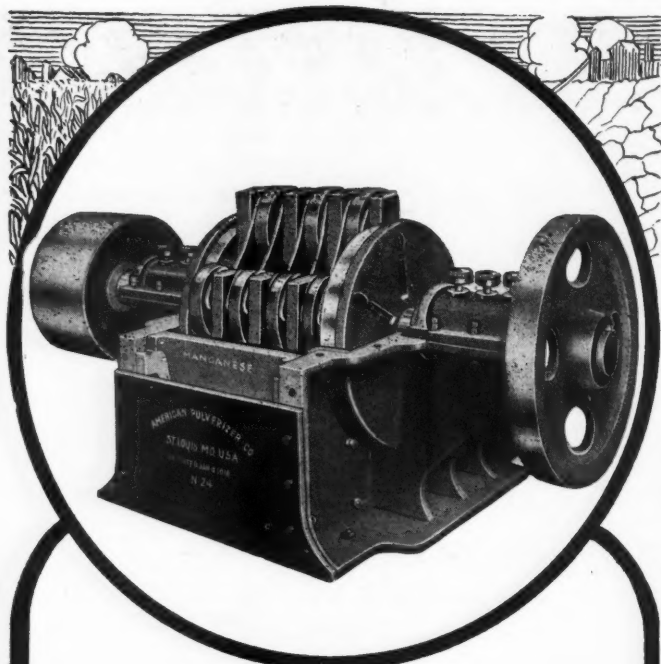
*They require only water and ordinary carbide,
sold everywhere.*

Circular 236 tells more about them!

THE ALEXANDER MILBURN CO., Baltimore, U. S. A.
Manufacturers of Portable Carbide Lights and Oxy-Acetylene Apparatus

You will get entire satisfaction if you mention ROCK PRODUCTS.





LIMESTONE for the Farmer

Each day a greater number of Farmers come to realize the importance of limestone as a fertilizer. With this constantly increasing demand an

AMERICAN RING PULVERIZER

will make limestone a profitable product for you. A simple, efficient, automatic machine—guaranteed to fill your needs at the lowest power consumption.

Write for plans and prices today!

AMERICAN PULVERIZER CO.

Corner 18th and Austin Streets
ST. LOUIS, MO.

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Jaite Company, The
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BIN GATES

Beaumont Co., R. H.

CARBIDE LIGHTS

Alexander Milburn Co., The

CALCINING MACHINERY

Atlas Car & Mfg. Co.
Butterworth & Lowe

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Carolina Portland Cement Co.
Huron Wyandotte Portland Cement Co.

CHAINS AND TRANSMITTING MACHINERY

Stephens-Adamson Mfg. Co.

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Jeffrey Mfg. Co., The
Webster Mfg. Company
Gifford-Wood Co.
Stephens-Adamson Mfg. Co.
Weller Mfg. Co.

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McMyler-Interstate Co.

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Woodville Lime Products Co.

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MOTORS, ELECTRIC

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Sturtevant Mill Co.
The W. S. Tyler Co.

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TESTING SIEVES AND TESTING SIEVE SHAKERS

The W. S. Tyler Co.

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American Steel & Wire Co.
Leschen, A., & Sons Co.
Waterbury Co.

WIRE CLOTH

Audubon Wire Cloth Co.
The W. S. Tyler Co.

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

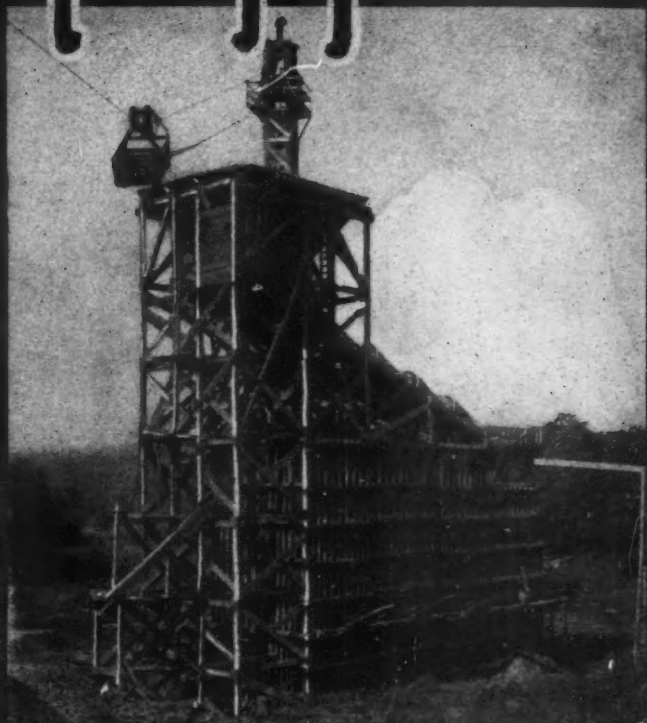
DULL Equipped

Experienced operators select Dull Sand and Gravel Washing Equipment not only for efficiency but also for its superior worth which has been proven through time and actual performance.

Progressive producers agree with us that Dull equipped plants mean satisfaction. Our catalog shows typical illustrations. Get it!

The RAYMOND W. DULL Co.

1914 Conway Building, Chicago, Ill.



Stroh Steel

THE result of a secret process of casting Stroh Alloy (which is harder than the finest tool steel) with a softer and less expensive metal at one pouring. This method makes the surface of the casting wear-proof, with a guarantee of greater service per unit of cost.

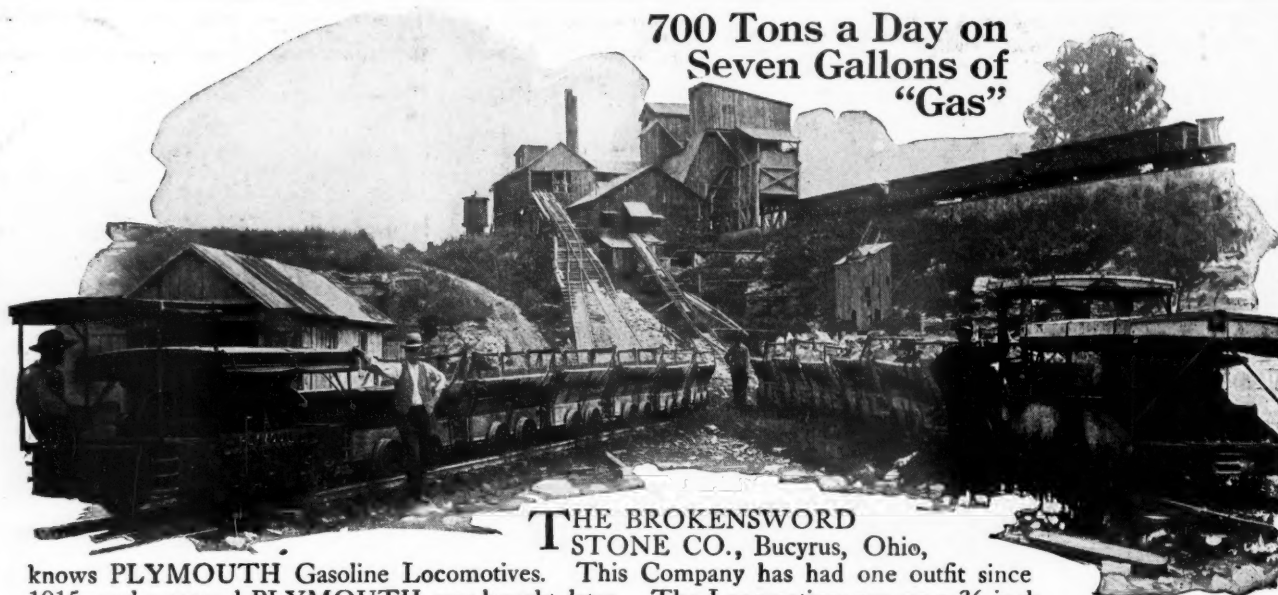
**WEARS FROM 3 TO 10 TIMES
LONGER THAN ORDINARY CASTINGS**

Get details of the Stroh process: **STRONG**—where necessary.
TOUGH—where necessary. **HARD**—where necessary.

STROH STEEL HARDENING PROCESS CO.
PITTSBURGH, PENNSYLVANIA

F. LLOYD MARK, Monadnock Bldg., Chicago, Western Representative
HICKOCK & HICKOCK, Portland, Ore., and San Francisco, Calif., Coast Representatives

It gets immediate attention if you mention ROCK PRODUCTS.



700 Tons a Day on
Seven Gallons of
"Gas"

**THE BROKENWORD
STONE CO., Bucyrus, Ohio,**

knows PLYMOUTH Gasoline Locomotives. This Company has had one outfit since 1915, and a second PLYMOUTH was bought later. The Locomotives run on a 36-inch gauge track, and make 3000-foot hauls under load. Handling from 500 to 700 tons per day, they consume but 7 gallons of gasoline each and require but a minimum of attention. The owners say:

"The PLYMOUTH is the Best Industrial Locomotive Going"

The haul includes some sharp curves and the tracks are more or less irregular—none of which have made any difference to The Brokenword Stone Co.'s PLYMOUTHs.

Write now for particulars about PLYMOUTHs and their

work in the service of firms right in your own and allied lines—companies who bought PLYMOUTHs only when absolutely convinced that they would reduce expenses, increase output, and stabilize conditions all around.

We'll gladly send you the facts—without obligating you in the least.

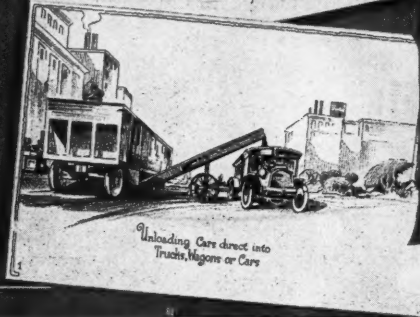
THE J. D. FATE COMPANY, 210 Riggs Avenue, PLYMOUTH, OHIO

Sales Representatives in all Principal Districts

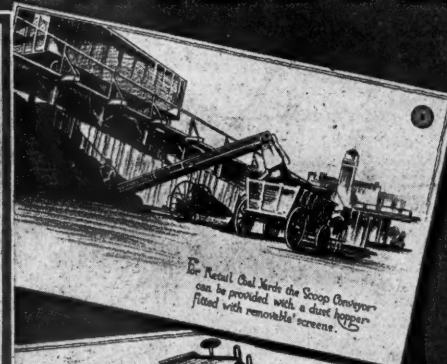
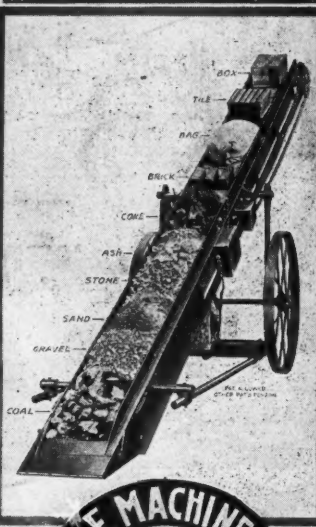
The SCOOP CONVEYOR



Unloading Cars with one, two, three or more Scoop Conveyors



Unloading Cars direct into Trucks, Wagons or Cars



The Metal Coal Yard the Scoop Conveyor can be provided with a dust hopper fitted with removable screens.

Loading Coal Car from ground or platform. A Scoop Conveyor may be placed right into the Car to fill up the ends.

OVER ONE THOUSAND USERS find this machine an indispensable saver of time, labor, and money for rapid, clean and economic loading and unloading of cars, stacking coal, sand, gravel, cement, lime, crushed rock and other loose material, as well as handling boxes, bags, crates and bulky packages of all kinds.

PORTABLE MACHINERY COMPANY, Inc.

One man and the Scoop Conveyor can do the work of from 6 to 12 men.

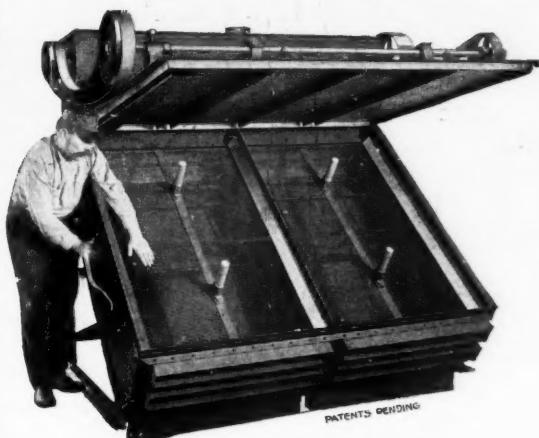
Ask for our literature and mention "Rock Products"

Park Place, Passaic, N. J.

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

THE TURN OF A KEY

Maintains
WHIP-TAP "DRUMHEAD" TENSION



Operator turning key to bring WHIP-TAP to "drumhead tension"

The WHIP-TAP Separator Screen, like the kettle drum, is so designed that the tension is at all times under the control of the operator. By merely turning a key, the tension is maintained at the correct degree to produce maximum screening efficiency.

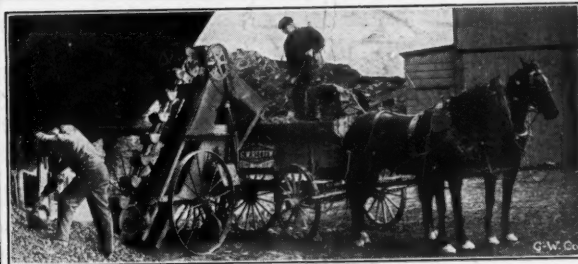
The WHIP-TAP screening surface is always taut and smoothly stretched; every wire is constantly vibrating; and the material flows uniformly over the entire screening surface, allowing every opportunity for the fines to be separated from the coarse.

TONNAGE-CAPACITY AND CLEAN SEPARATION DEPEND UPON A TAUT, SMOOTHLY-STRETCHED, AND EFFECTIVELY VIBRATED SCREENING SURFACE.

WRITE FOR WHIP-TAP CATALOGUE

THE W. S. TYLER COMPANY

Manufacturers of TYLER "Double Crimped" Wire Cloth and Mining Screen CLEVELAND, OHIO



G-W LOADERS

*** reduce delivery cost and eliminate idle trucks—improving your service—because they save much time in loading.

— they save a great deal of hand labor, thereby reducing your payroll.

— their operation is economical because they handle any loose material at a very low cost per ton.

and G-W is the Loader you will buy because it is the most efficient and durable loader you can find.

Can we send you literature explaining G-W Loaders in detail?

GIFFORD-WOOD CO.

HUDSON, N. Y.

New York
Boston

Buffalo

Philadelphia
Chicago



Hercules (Red-Strand) Wire Rope

Back of every HERCULES (Red Strand) Wire Rope is a large modern factory, directed by experienced engineering and manufacturing departments, and operated by skilled workmen.



Reg. U. S. Pat. Off.

We make a study of Wire Rope working conditions, and are at all times glad to confer with you regarding your problems along this line.

WRITE US

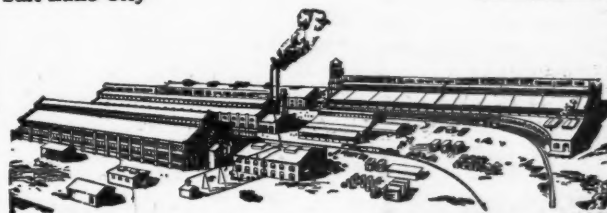
A. Leschen & Sons Rope Co.

St. Louis, U. S. A.

New York
Salt Lake City

Chicago

Denver
San Francisco



Saying "I saw it in ROCK PRODUCTS" will bring quick action.

UNCLE SAM'S TEST of HYDRATED LIMES

FAK/CE.

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

WASHINGTON

ADDRESS REPLY TO
BUREAU OF STANDARDS
40TH AND BUTLER STS.
PITTSBURGH, PA.

Pittsburgh Branch

July 19th, 1918.

Woodville Lime Products Co.,
Nicholas Building,
Toledo, Ohio.

Gentlemen:

On April 24th we reported to you results of tests made upon a sample of White Enamel Hydrated Lime received April 10th. The mortars described in this report have been tested for compressive and tensile strength after storing in air for 90 days with the results given below:

	Proportions		Strength Pounds per Sq. In.	
	by	Weight	Compressive	Tensile
✓ White Enamel:	1:3	:	453	112
✓ " "	1:4	:	267	76
✓ " "	1:5	:	250	74
Ave. High	:	:	:	:
Magnesian	1:3	:	324	67
Ave. High	:	:	:	:
Calcium	1:3	:	244	45

White Enamel Mortars were remarkably strong. In every case they are the strongest of the mortars made from any of the 54 hydrated limes so far tested.

This completes the tests to be made upon this sample.

Thanking you again for your co-operation in this matter, we remain

Yours very truly,

W. T. Blinn
For the Director.
FAK

THE WOODVILLE LIME PRODUCTS CO.
TOLEDO ... OHIO.